



OCOEE CITY COMMISSION

Ocoee Commission Chambers
1 N. Bluford Avenue
Ocoee, Florida

May 21, 2024

AGENDA

6:15 PM

REGULAR CITY COMMISSION MEETING

• CALL TO ORDER

Invocation

Pledge of Allegiance

Roll Call and Determination of Quorum

• PRESENTATIONS AND PROCLAMATIONS

2024 Asian American and Pacific Islander Heritage Month Proclamation

Ocoee Music Festival Chick-fil-A 5k Beneficiary Check Presentation. (**Parks and Recreation Director Johnson**)

Ocoee Youth Council (OYC) Program 2023/2024 Year in Review and Recognition of OYC High School Graduates. (**OYC Members and City Clerk Sibbitt**)

• STAFF REPORTS AND AGENDA REVIEW

• PUBLIC COMMENTS

• CONSENT AGENDA

Matters listed under the consent agenda are considered to be routine and will be acted upon by one motion. There will be no separate discussion of these items unless discussion is desired by a member of the commission on a motion and a second, in which case the Mayor will instruct the City Clerk to remove that item from the Consent Agenda and such item will be considered separately.

1. Approval of Minutes from the Regular City Commission Meeting held May 7, 2024. (**City Clerk Sibbitt**)
2. Approval of JAG Grant 15PBJA-23-GG-03230-JAGX. (**Assistant Police Chief McKinstry**)
3. Approval of a Two-Year Warranty Surety and Maintenance, Materials, and Workmanship Agreement for Commerce 429. (**Development Engineer Keaton**)
4. Approval of a Two-Year Warranty Surety and Maintenance, Materials, and Workmanship Agreement for Christian Brothers Automotive. (**Development Engineer Keaton**)
5. Approval of First Amendment to the 15 S. Kissimmee Street and 214 W. McKey Street Contract. (**Development Services Director Rumer**)
6. Approval of Award of ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid. (**Procurement Manager Tolbert**)

7. Approval of 2023-2024 Capital Improvement Project with Superior Sheds. **(Public Works Director Krug)**
8. Approval of Change Order No.1 for Contracted Sidewalk Repairs Utilizing Existing City of Kissimmee Contract with APEC LLC. **(Public Works Director Krug)**

• **FIRST READING OF ORDINANCE**

9. First Reading of Ordinance to Implement Speed Enforcement Cameras in School Zones. **(Police Chief Ogburn)**

• **SECOND READING OF ORDINANCE – PUBLIC HEARING**

10. Second Reading of Ordinances for 789 Pine Street Small-Scale Comprehensive Plan Amendment from Low-Density Residential (LDR) to Light Industrial (LI) & Rezoning from Single-Family Dwelling (R-1A) to Restricted Manufacturing & Warehousing (I-1); Project No. CPA-2024-002 & RZ-24-02-01. **(Development Services Director Rumer)**
11. Second Reading of Ordinance for 1 Taylor Street Small-Scale Comprehensive Plan FLU Amendment from Heavy Industrial (HI) to Commercial (COMM) & Rezoning from I-1 (Restricted Manufacturing and Warehousing) to C-2 (Community Commercial); Project Nos. CPA-2024-004 & RZ-24-03-02. **(Development Services Director Rumer)**
12. Second Reading of Ordinance for 1059 Ocoee Apopka Road - Rodgers Property Annexation; Project No. AX-03-24-03. **(Zoning Manager Whitfield)**
13. Second Reading of Ordinance for 1102 & 1104 N. Lakewood Avenue - Lott Property Annexation; Project No. AX-03-24-01. **(Zoning Manager Whitfield)**
14. Second Reading of Ordinance for 1305 & 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property Annexation; Project No. AX-03-24-02. **(Zoning Manager Whitfield)**
15. Second Reading of Ordinance for MDTL Enterprise LLC Property Annexation; Project No. AX-03-24-04. **(Zoning Manager Whitfield)**
16. Second Reading of Ordinance for Gardenia Pointe Rezoning from Unclassified District and R-1A (Single-Family Dwelling) to PUD (Planned Unit Development District); Project No. RZ-23-02-02. **(Zoning Manager Whitfield)**

• **PUBLIC HEARING**

• **REGULAR AGENDA**

• **COMMENTS FROM COMMISSIONERS**
(Limit to Five Minutes)

• **ADJOURNMENT**

**Regular City Commission
May 21, 2024**

APPEALS: In accordance with Florida Statutes § 286.0105: Any person who desires to appeal any decision at this meeting will need a record of the proceedings and for this purpose may need to ensure that a verbatim record of the proceedings is made which includes the testimony and evidence upon which the appeal is based.

ACCOMMODATIONS FOR DISABILITIES: In accordance with Florida Statute § 286.26: Persons with disabilities needing assistance to participate in any of these proceedings should contact the Office of the City Clerk, 1 N. Bluford Avenue, Ocoee, FL 34761, (407) 905 -3105 48 hours in advance of the meeting.



Proclamation

Whereas, Asian Americans and Pacific Islanders have enriched the history, society and culture of the United States of America including dying and risking their lives building the first Transcontinental Railroad; initiating *United States v. Wong Kim Ark*, 169 U.S. 649 (1898), the landmark decision that has given birthright citizenship to the children of countless immigrants to the United States from all over the globe for over 120 years; and sacrificing their lives in defense of our country; and

Whereas, In recognition of the significant contributions by Asian Americans and Pacific Islanders to the United States of America, then President Jimmy Carter signed a bill into law in 1978 proclaiming the first ten days of May 1979 as Asian American and Pacific Islander Heritage Week; and

Whereas, Then President George H.W. Bush signed a bill into law in 1990 extending the week-long celebration to an entire month resulting in the official designation of the month of May as Asian American and Pacific Islander American Heritage Month beginning in 1992 and requesting that future Presidents issue a proclamation calling on the people of the United States to observe the month of May with appropriate programs, ceremonies, and activities; and

Whereas, In continuation of the history of Asian Americans and Pacific Islanders' commitment to service to our country, the Federal Asian Pacific American Council has selected its 2024 theme for Asian American and Pacific Islander Heritage Month to be ***Advancing Leaders Through Innovation***; and

Whereas, The efforts, resilience, and contributions of the culturally and linguistically diverse Asian American and Pacific Islander' communities can be seen in every aspect of society in the United States such as education, military, politics, health care, economics, and science; and

Whereas, The City of Ocoee recognizes the importance of inclusion and diversity in building a brighter future for all our residents including our current, and future, Asian American and Pacific Islander' citizens; and

Whereas, The City of Ocoee is proud to have a diverse community that includes an Asian American and Pacific Islander population of over 3,533 (7.5%).

Now, therefore be it resolved, that the City Commission of the City of Ocoee, does hereby proclaim the month of May 2024 as

Asian American and Pacific Islander Heritage Month

in the City of Ocoee and encourage all citizens of Ocoee to learn more about, and pay tribute to, the significant contributions of generations of Asian Americans and Pacific Islanders, and to assist in furthering our efforts for an inclusive and equitable city for all our citizenry.

IN WITNESS WHEREOF, I hereunto have
Set my hand and caused the Seal of the
City of Ocoee, Florida to be affixed this
7th day of May, 2024.

Rusty Johnson, Mayor

OCOEE CITY COMMISSION
Ocoee Commission Chambers
1 N. Bluford Avenue
Ocoee, Florida

May 7, 2024

MINUTES

6:15 PM

REGULAR CITY COMMISSION MEETING

• **CALL TO ORDER 6:17 PM**

Mayor Johnson called the regular session to order at 6:17 PM in the Commission Chambers of City Hall. The invocation was led by **Ages Hart**, *Ocoee Resident*, followed by the Pledge of Allegiance to the Flag led by **Commissioner Firstner**. **City Clerk Sibbitt** called the roll and declared a quorum present.

Present: Mayor Johnson, Commissioner Kennedy, Commissioner Wilsen, Commissioner Firstner, Commissioner Oliver

Also Present: Assistant City Manager Shadrix, City Attorney Geller, City Clerk Sibbitt

• **PRESENTATIONS AND PROCLAMATIONS 6:18 PM**

2024 Municipal Clerks Week Proclamation - proclaimed by **Mayor Johnson**.

2024 National Day of Prayer Proclamation – read and proclaimed by **Mayor Johnson**. Proclamation was accepted by Judy Chadwick with Orlando House of Prayer (OHOP).

2024 Asian American and Pacific Islander Heritage Month Proclamation – proclaimed by **Mayor Johnson**.

2024 National Peace Officer Memorial Day and National Police Week – read by **Commissioner Kennedy** and proclaimed by **Mayor Johnson**. Proclamation was accepted by Deputy Police Chief Nylander.

• **STAFF REPORTS AND AGENDA REVIEW - None**

• **PUBLIC COMMENTS 6:27 PM**

The following person addressed the City Commission:

- **Jim Moyer**, *Ocoee Resident*, shared information about the HRDB Speaker Series Workshop on “Fostering a Sense of Belonging” that was conducted by Kavita Sawh from UCF's Ginsburg Center for Inclusion and Community Engagement in May, and announced their upcoming June series which is also open for public participation. He further announced additional observances recognized in the month of May.

• **CONSENT AGENDA 6:30 PM**

Consent Agenda Motion

Motion: Move to adopt the Consent Agenda Item #1-5; Moved by Commissioner Wilsen, seconded by Commissioner Kennedy; Motion carried 5-0.

1. Approval of Minutes from the Regular City Commission Meeting held April 16, 2024. **(City Clerk Sibbitt)**
2. Approval to Award Ocoee Neighborhood Matching Grants. **(Community Relations Manager Wright)**
3. Approval of Magnolia Reserve Plat; Project No. LS-2023-005. **(Development Engineer Keaton)**
4. Approval to Award Invitation to Bid (ITB) #24-007 Job Order for Thornebrooke Drainage Ditch Improvements. **(Procurement Manager Tolbert)**
5. Approval of Change Order No. 1 for Ocoee Debris Monitoring and Grants Management Services - Hurricane Ian. **(Public Works Director Krug)**

• **FIRST READING OF ORDINANCE 6:32 PM**

6. First Reading of Ordinances for 789 Pine Street Small-Scale Comprehensive Plan Amendment from Low-Density Residential (LDR) to Light Industrial (LI) & Rezoning from Single-Family Dwelling (R-1A) to Restricted Manufacturing & Warehousing (I-1); Project No. CPA-2024-002 & RZ-24-02-01. **(Development Services Director Rumer)**

City Attorney Geller read the title of the ordinance, and it was announced this will be presented as a second reading and public hearing at the next scheduled City Commission meeting on May 21, 2024, at 6:15 PM or soon thereafter.

7. First Reading of Ordinance for 1 Taylor Street Small-Scale Comprehensive Plan FLU Amendment from Heavy Industrial (HI) to Commercial (COMM) & Rezoning from I-1 (Restricted Manufacturing and Warehousing) to C-2 (Community Commercial); Project Nos. CPA-2024-004 & RZ-24-03-02. **(Development Services Director Rumer)**

City Attorney Geller read the title of the ordinance, and it was announced this will be presented as a second reading and public hearing at the next scheduled City Commission meeting on May 21, 2024, at 6:15 PM or soon thereafter.

8. First Reading of Ordinance for 1102 & 1104 N. Lakewood Avenue - Lott Property Annexation; Project No. AX-03-24-01. **(Zoning Manager Whitfield)**

City Attorney Geller read the title of the ordinance, and it was announced this will be presented as a second reading and public hearing at the next scheduled City Commission meeting on May 21, 2024, at 6:15 PM or soon thereafter.

**Regular City Commission Meeting
May 7, 2024**

9. First Reading of Ordinance for 1305 & 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property Annexation; Project No. AX-03-24-02. **(Zoning Manager Whitfield)**

City Attorney Geller read the title of the ordinance, and it was announced this will be presented as a second reading and public hearing at the next scheduled City Commission meeting on May 21, 2024, at 6:15 PM or soon thereafter.

10. First Reading of Ordinance for 1059 Ocoee Apopka Road - Rodgers Property Annexation; Project No. AX-03-24-03. **(Zoning Manager Whitfield)**

City Attorney Geller read the title of the ordinance, and it was announced this will be presented as a second reading and public hearing at the next scheduled City Commission meeting on May 21, 2024, at 6:15 PM or soon thereafter.

11. First Reading of Ordinance for MDTL Enterprise LLC Property Annexation; Project No. AX-03-24-04. **(Zoning Manager Whitfield)**

City Attorney Geller read the title of the ordinance, and it was announced this will be presented as a second reading and public hearing at the next scheduled City Commission meeting on May 21, 2024, at 6:15 PM or soon thereafter.

• **SECOND READING OF ORDINANCE – PUBLIC HEARING - None**

• **PUBLIC HEARING 6:40 PM**

12. Ocoee Pickleball Complex - Vasant Sports LLC Special Exception; Project No. 03-24-SE-031. **(Zoning Manager Whitfield)**

Zoning Manager Whitfield presented a brief overview of the Vasant Sports LLC Special Exception which is located on the west side of Jacob Nathan Boulevard at the terminus of Matthew Paris Boulevard, and is approximately 6 acres in size. She explained that per Table 5-1 in the Land Development Code, a Special Exception is required for outdoor commercial recreational uses on property with C-2 zoning. She conveyed that the proposed project meets the standards established by section 4-8B of Article IV, Land Development Code for the Special Exception to be granted. She explained that modifications to ingress/egress and circulation may be necessary at the time of site plan review and advised that staff has researched similar facilities because the Land Development Code does not set a parking standard for commercial recreational uses. There are concerns that the proposed parking ratio is insufficient; the Development Review Committee and staff recommend that the parking demand be evaluated at the time of site plan review and approval.

Mayor Johnson opened the public hearing.

Sravan Tummala, Applicant and Project Manager, provided a PowerPoint presentation which highlighted the popularity of the pickleball sport and courts that can be found in the surrounding areas. He explained the reason that Ocoee was chosen for their pickleball facility.

The following persons addressed the City Commission:

- **Kellee Walshee, Hammocks President HOA and Ocoee Resident**, expressed her opposition to the project due to the noise that will impact their neighboring community, and potential decline in their property value.
- **Lisa Stinson, Ocoee Resident**, expressed her opposition to the project due to the noise that will impact her neighboring community. She further recommended a sound impact study be conducted.
- **Eileen Staples, Ocoee Resident**, spoke in opposition to the pickleball courts, due to the location, stating that it will destroy the serenity of her property. She asked the Commission to find land elsewhere, more appropriate for this type of project.

Mayor Johnson inquired what the distance of the project was to the nearest residential property. **Development Services Director** addressed his question.

- **Lili Cordell, Ocoee Resident**, expressed that she does not object to bringing new development to the City; however, she objects to this particular rezoning due to the high noise level and the increased amount of traffic, the project will bring. She questioned if the developer could build an all indoor facility versus outdoor courts.
- **Daniel Stinson, Ocoee Resident**, expressed his opposition to the project and voiced concerns on declining property value, and disturbance of peace.
- **William Cordell, Ocoee Resident**, voiced support for the pickleball sport and the development of an indoor facility only. He inquired if FDOT studies have been conducted to accommodate this project. He also questioned the parking ratio and if there are adequate parking spaces for the number of proposed courts.
- **Catherine Carpenter, Ocoee Resident**, expressed her support for the pickleball sport but shared she agrees with her neighbors concerns regarding the noise. She recommended that the City Commission visit a pickleball court to better understand their concerns.

Mayor Johnson closed the public hearing.

Sravan Tummala, Applicant and Project Manager, shared that he has met with the residents and heard their concerns about the noise. He explained the barriers they will be installing to assist with the noise concerns, and shared that they agreed to consider moving the outdoor courts to

**Regular City Commission Meeting
May 7, 2024**

the south of the property. Additionally, in their meeting with the residents, they spoke about reducing the hours of operation in the outdoor courts depending on the demand of the players.

Commissioner Wilsen shared she resides in the Hammocks and understands her neighbors' concerns but wanted to hear from the other Commissioners before sharing additional comments.

Commissioner Kennedy inquired if the applicant is Florida-based and if they own any other facility such as those shown in his presentation. **Mr. Tummala** addressed his questions. **Commissioner Kennedy** further inquired if alcohol would be sold on the property, and why is the applicant not considering just an indoor facility. **Mr. Tummala** addressed his questions. **Commissioner Kennedy** inquired on the number of tournaments that would be hosted and the parking ratio that is being requested. He further inquired if a sound and traffic study have been completed, and if they have done studies on impact of home values. **Mr. Tummala** addressed all his questions.

Commissioner Firstner expressed that it seems that more courts are being requested than the property can handle. He further commented that he is in favor of a reduced size indoor facility to address the concerns voiced this evening, and shared that one of the vacant anchor stores in the West Oaks Mall would have been a feasible location for this project. **Mr. Tummala** addressed his concerns.

Commissioner Oliver commented that he understands the noise concerns but has also read a lot of positive things about the pickleball sport. He feels that this project will enhance the City but feels there are some major concerns with parking and traffic. He further commented while this project seems like a great facility he agrees with previous comments that another location would be a better solution.

Mayor Johnson shared that the property is zoned Commercial and other developers may consider placing a project that may not be favorable to the residents. He voiced that the outdoor courts should have been placed on the south side to lessen the noise concerns, but feels the distance should be sufficient.

Development Services Director Rumer clarified that this is not a rezoning request from the applicant, as the property is zoned Commercial. He explained the request is for a Special Exception that borders a 6-lane arterial road; therefore, trips are also not an appropriate discussion point for this project as it is already considered under the Commercial subdivision. He provided explanation on the reason for the outdoor courts not being placed on the south side and shared that the Special Exception is for 24 outdoor courts not the 44 proposed courts which is the total amount of courts. He explained the criteria for the Special Exception and all the boxes that were checked to support this request.

Commissioner Wilsen explained what assurances and conditions she needed, when the applicant comes back with the site plan approval, to receive her approval on this Special Exception and assure her residents that they were heard.

**Regular City Commission Meeting
May 7, 2024**

Development Services Director Rumer explained that the next step to the project is the preliminary site plan and will be conducted as a public hearing for input from the residents.

Mr. Tummala addressed Commissioner Wilsen's request and explained they can add any type of barrier that will assist with reducing the sound. He further advised that as long as the project cost does not increase he would be willing to consider changes. **Commissioner Wilsen** inquired if this item could be continued as she is not receiving the reassurance she was hoping for. **Assistant City Manager Shadrix** asked the City Attorney to advise the City Commission on their options on the project before them with regards to placing conditions or continuances. **City Attorney Geller** explained that tabling the item is allowed but if they were to approve the item he recommended that the approval be contingent on the standards that are listed in the Land Development Code.

Motion: Move to deny the Ocoee Pickleball Complex – Vasant Sports LLC Special Exception, Project Number 03-24-SE-031; Moved by Commissioner Kennedy, Seconded by Commissioner Oliver.

Commissioner Kennedy inquired when could the applicant come back before the City Commission. **Development Services Director Rumer** addressed his question.

***Mayor Johnson** opened the public hearing.*

William Cordell, Ocoee Resident, inquired if the applicant could come back and propose all outdoor courts if it is not financially feasible for him to do all indoor courts. **Mayor Johnson** addressed his question.

***Mayor Johnson** closed the public hearing.*

After discussion. Motion carried 5-0.

• **REGULAR AGENDA 8:01 PM**

13. Notification of Initial Three-Year Term Ending for One (1) Regular Member, Move Alternate Member to Regular Member, and Consideration of Appointment on the Planning and Zoning Commission. (**Development Services Director Rumer and City Clerk Sibbitt**)

City Clerk Sibbitt explained the terms of Members Crocker and Forges are set to expire in June 2024. Member Crocker has expressed no interest in being considered for reappointment, while Member Forges has expressed interest in being reappointed and is eligible for one more three-year term. Alternate Member Chacon desires to be appointed as a regular member. Furthermore, one (1) application has been on file since March 2023, and the applicant has indicated an interest in being considered for appointment, updating their application accordingly, and on May 6, 2024, another application was received. Both applications are before them for consideration.

Motion: Move to reappoint Member Forges to complete his final three-year term, move

alternate Member Chacon to a Regular Member seat, appoint Joaquin Galvan to a three-year term, and appoint Kelton Butler as an alternate member to complete a term; Moved by Mayor Johnson, Seconded by Commissioner Kennedy. Motion carried 5-0.

14. Discussion and Direction on Holiday Lighting. (Public Works Director Krug)

Public Works Director Krug explained the Commission expressed an interest in reviewing the future holiday pole-mounted lighting throughout the City. Public Works has explored what is commercially available and is presenting options to the Commission for approval to move forward with incorporating the recommendations into future budgets. **Mayor Johnson** voiced the need to go out to bid has they have had issues in the past. **Commissioner Wilsen** shared the City Commission appointed her to meet with City staff and she assisted on the selection being presented. After the presentation, **Public Works Director Krug** asked for consensus on how to proceed. Discussion ensued. **Consensus of the City Commission was to have City staff proceed with the options presented in the staff report.**

• COMMENTS FROM COMMISSIONERS 8:15 PM

Commissioner Kennedy – None

Commissioner Wilsen – Commented on the following:

- 1)** Thanked Mayor Johnson for this work on the Ocoee Music Festival and shared this has been an iconic event for the City over the past 30 years.
- 2)** Reminded the Neighborhood Grant recipients to get with the permitting department to facilitate the permitting requirements for the grants.
- 3)** Addressed Commissioner Oliver and stated that she has a problem with him attending an HOA meeting within her district, without notice, because it could violate the Sunshine Law.
- 4)** Urged her neighborhood to come together as a group to meet, in preparation of the pickleball special exception returning.

Commissioner Oliver – Commented on the following:

- 1)** Apologized to Commissioner Wilsen stating that he was not aware that he could not attend an HOA meeting in another district. He stated that had she been there, he would have left; he attends a lot of HOA meetings to take notes and get ideas on how to handle certain issues in other HOA's.
- 2)** Discussed traffic accidents, between bicyclists and motorists, that have been happening along the West Orange Trail and stated that he has reached out to the County in hopes to have a solution to the issue, within the next few months.
- 3)** Acknowledged that there are several foster care facilities within the city and announced that any person who has aged out of foster care or has been a ward of the state is eligible for free college. He suggested to add some information on the City's website for those interested or needing the information.
- 4)** Finished with a Biblical scripture reading.

**Regular City Commission Meeting
May 7, 2024**

Commissioner Firstner – Commented on the following:

- 1) Announced that today is Teacher Appreciation Day.
- 2) Announced that Hurricane Preparedness Week is May 5th – May 11 and Hurricane Season begins June 1st.
- 3) Announced the City Aquatic Center opens May 11th.
- 4) Announced the Memorial Day Ceremony being held on May 23rd.

Mayor Johnson – Commented on the following:

- 1) Thanked Commissioner Wilsen for speaking on the Ocoee Music Festival. He further commented on the success of the free concert to the Community.
- 2) Stated that if he is going to any meeting, he makes sure it is noticed and posted. He urged that everyone pay attention and be more careful, when it comes to Sunshine Law.
- 3) Stated he received a request to have a speed table in a neighborhood in District 2, he will give the information to Assistant City Manager Shadrix and Commissioner Wilsen.
- 4) Announced that the Ocoee Music Festival was a great event with only a few complaints concerning the fireworks.
- 5) Expressed that they do not give enough credit to the Parks and Recreation Department; there are a lot of events and programs that are free for children to attend.
- 6) Reiterated that he wants to get a plan together with the Pickleball Complex Developer, so that he can develop his property.
- 7) Expressed that there needs to be a Code Enforcement Officer on duty on Saturdays; and further shared his discontent with code violations out at the West Oaks Mall. He also expressed the need for personnel to be hired to oversee the picnic area by Starke Lake during the Summer weekends.

• ADJOURNMENT 8:35 PM

APPROVED:

Attest:

City of Ocoee

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor



Meeting Date: May 21, 2024
Item #: 2

Contact Name: Chris McKinstry
Contact Number: Ext. 3055

Department Director: Vincent Ogburn
City Manager: Robert Frank

Subject: Approval of JAG Grant 15PBJA-23-GG-03230-JAGX. (Assistant Police Chief McKinstry)

Background Summary:

This grant funding provides for the purchase of Forward Looking Infrared (FLIR), which is specifically used to address criminal activity. The Forward Looking Infrared (FLIR) would be deployed to assist in surveillance, to identify criminal activity, and to aid in apprehension. The City has been awarded \$13,818 through 15PBJA-23-GG-03230-JAGX.

Issue:

Should the Honorable Mayor and City Commissioners approve accepting the funds allocated through the grant and expending the awarded funds for the purpose intended?

Recommendations:

Staff recommends that the Honorable Mayor and City Commissioners authorize the approval to accept the allocated grant funds and expend them for their intended purpose.

Attachments:

1. O-BJA-2023-171790

Financial Impacts:

\$13,818 (grant funded). Neutral financial impact on the existing budget. No matching funds required.

Type of Item: Consent

U.S. Department of Justice
Office of Justice Programs
Bureau of Justice Assistance

OMB No. 1121-0329
Expires 12/31/2023



BJA FY 23 Edward Byrne Memorial Justice Assistance Grant (JAG) Program - Local Solicitation

Assistance Listing Number # 16.738

Grants.gov Opportunity Number: O-BJA-2023-171790

Solicitation Release Date: June 30, 2023 12:00 PM ET

Application Grants.gov Deadline: October 23, 2023 8:59 PM ET

Application JustGrants Deadline: October 24, 2023 8:59 PM ET

Overview

The [U.S. Department of Justice](#) (DOJ), [Office of Justice Programs](#) (OJP), [Bureau of Justice Assistance](#) (BJA) seeks applications for funding under the Edward Byrne Memorial Justice Assistance Grant (JAG) Program. This program furthers the DOJ's mission by assisting state, local, and tribal jurisdictions' efforts to prevent or reduce crime and violence and to improve the fair administration of the justice system.

This solicitation incorporates guidance provided in the [OJP Grant Application Resource Guide](#) which provides additional information for applicants to prepare and submit applications to OJP for funding. **If this solicitation expressly modifies any provision in the OJP Grant Application Resource Guide, the applicant is to follow the guidelines in this solicitation as to that provision.**

This solicitation expressly modifies the OJP Grant Application Resource Guide by not incorporating the "Limitation on Use of Award Funds for Employee Compensation; Waiver" provisions in the "Financial Information" section of the [OJP Grant Application Resource Guide](#).

Solicitation Categories

Competition ID	Category *	Number of Awards	Dollar Amount for Award	Performance Start Date	Performance Duration (Months)
C-BJA-2023-00104-PROD	Category 1– Applicants with eligible allocation amounts of less than \$25,000	678	\$10,420,302	10/1/22 12:00 AM	24
C-BJA-2023-00105-PROD	Category 2–Applicants with eligible allocation amounts of \$25,000 or more	618	92,358,317	10/1/22 12:00 AM	48

Eligible Applicants:

City or township governments, County governments, Native American tribal governments (Federally recognized), Special district governments

By law, for purposes of the JAG Program, the term “units of local government” includes a town, township, village, parish, city, county, borough, or other general-purpose political subdivision of a state; or it may be a federally recognized American Indian tribal government that performs law enforcement functions (as determined by the Secretary of the Interior). A unit of local government also may be any law enforcement district or judicial enforcement district established under applicable state law with authority to independently establish a budget and impose taxes; for example, in Louisiana, a unit of local government means a district attorney or parish sheriff. The eligible allocations by state for the fiscal year (FY) 2023 JAG Program can be found at: <https://bjaojp.gov/program/jag/fy-2023-allocations>.

Eligible allocations under the JAG Program are posted annually on the [JAG web page](#). See the Allocation Determination and Units of Local Government Requirements Regarding Use of JAG Funds section for more information. **Applicants with eligible allocation amounts of less than \$25,000 will apply to Category 1, and applicants with eligible allocation amounts of \$25,000 or more will apply to Category 2.**

Contact Information

For assistance with the requirements of this solicitation, contact the OJP Response Center at 800-851-3420, 301-240-6310 (TTY for hearing-impaired callers only), or grants@ncjrs.gov. The OJP Response Center operates from 10:00 a.m. to 6:00 p.m. eastern time (ET) Monday–Friday, and 10:00 a.m. to 8:00 p.m. ET on the solicitation

close date.

Submission Information

Registration: Before submitting an application, all applicants must register with the System for Award Management (SAM). You must renew and validate your registration every 12 months. If you do not renew your SAM registration, it will expire. An expired registration can delay or prevent application submission in Grants.gov and JustGrants. Registration and renewal can take up to 10 business days to complete.

Submission: Applications must be submitted to DOJ electronically through a two-step process via Grants.gov and JustGrants.

Step 1: The applicant must submit by the Grants.gov deadline the required Application for Federal Assistance standard form (SF-424) and a **Disclosure of Lobbying Activities (SF-LLL)** form when they register in Grants.gov at <https://www.grants.gov/web/grants/register.html>. **Submit the SF-424 and SF-LLL as early as possible, but no later than 48 hours before the Grants.gov deadline.** If an applicant fails to submit in Grants.gov, they will be unable to apply in JustGrants.

For technical assistance with submitting the SF-424 and an SF-LLL in Grants.gov, contact the Grants.gov Customer Support Hotline at 800-518-4726, 606-545-5035, [Grants.gov Customer Support](#), or support@grants.gov. The Grants.gov Support Hotline operates 24 hours a day, 7 days a week, except on federal holidays.

Step 2: The applicant must submit the **full application**, including attachments, in JustGrants at [JustGrants.usdoj.gov](https://www.justgrants.usdoj.gov) by the JustGrants application deadline.

For technical assistance with submitting the **full application** in JustGrants, contact the JustGrants Service Desk at 833-872-5175 or JustGrants.Support@usdoj.gov. The JustGrants Service Desk operates 7 a.m. to 9 p.m. ET Monday–Friday and 9 a.m. to 5 p.m. ET on Saturday, Sunday, and federal holidays.

OJP encourages applicants to review, the “How to Apply” section in the [OJP Grant Application Resource Guide](#) and the [JustGrants website](#) for more information, resources, and training. Applicants should maintain all receipts and confirmations received from SAM.gov, Grants.gov, JustGrants systems.

Contents

Overview	1
Contact Information	2
Program Description	6
Overview	6
Specific Information	6
Goals, Objectives, and Deliverables	19
Evidence-Based Programs	19
Information Regarding Potential Evaluation of Programs and Activities	19
Federal Award Information	20
General Guidance for Federal Award	20
Awards, Amounts and Durations	21
Type of Award	21
Financial Management and System Controls	21
Budget Information	21
Cost Sharing or Matching Requirement	21
Pre-agreement Costs (also known as Pre-award Costs)	22
Prior Approval, Planning, and Reporting of Conference/Meeting/ Training Costs	22
Costs Associated with Language Assistance (if applicable)	22
Availability of Funds	22
Eligibility Information	22
Application and Submission Information	22
Content of Application Submission	22
Information to Complete the Application for Federal Assistance (SF-424) in Grants.gov	23
Standard Applicant Information (JustGrants 424 and General Agency Information)	23
Proposal Abstract	23
Proposal Narrative	24
Budget and Associated Documentation	26
Budget Worksheet and Budget Narrative (attachment)	26
Indirect Cost Rate Agreement (if applicable)	26
Financial Management and System of Internal Controls	26
Questionnaire (including applicant disclosure of high-risk status)	26
Disclosure of Process Related to Executive Compensation	26
Additional Application Components	27

Research and Evaluation Independence and Integrity Statement	27
Memorandum of Understanding (if applicable)	27
Certifications and Assurances by the Chief Executive of the Applicant Government	27
Disclosure and Assurances	27
Disclosure of Lobbying Activities	28
DOJ Certified Standard Assurances	28
Applicant Disclosure of Duplication in Cost Items	28
DOJ Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; and Drug-Free Workplace Requirements; Law Enforcement and Community Policing	28
Applicant Disclosure and Justification – DOJ High Risk Grantees (if applicable)	28
How to Apply	28
Submission Dates and Time	29
Application Review Information	31
Review Process	31
Federal Award Administration Information	32
Federal Award Notices	32
Administrative, National Policy, and Other Legal Requirements	32
Information Technology (IT) Security Clauses	32
General Information about Post-Federal Award Reporting Requirements	32
Federal Awarding Agency Contact(s)	33
Other Information	33
Freedom of Information and Privacy Act (5 U.S.C. 552 and 5 U.S.C. 552a)	33
Provide Feedback to OJP	34
Application Checklist	35
Standard Solicitation Resources	37

Program Description

Overview

OJP is committed to advancing work that promotes civil rights and racial equity, increases access to justice, supports crime victims and individuals impacted by the justice system, strengthens community safety and protects the public from crime and evolving threats, and builds trust between law enforcement and the community.

With this solicitation, the Bureau of Justice Assistance (BJA) seeks to award Edward Byrne Memorial Justice Assistance Grant (JAG) Program funds to eligible units of local government. (BJA will issue a separate solicitation for applications from states).

For more information on the JAG Program, please refer to the [JAG Fact Sheet](#) and/or [JAG Frequently Asked Questions \(FAQs\)](#).

Statutory Authority: The JAG Program is authorized by Title I of Public Law 90-351 (generally codified at [34 U.S.C. 10151-10726](#)), including subpart 1 of part E (codified at 34 U.S.C. 10151-10158); see also 28 U.S.C. 530C(a).

Specific Information

Statutory Formula

JAG awards are based on a statutory formula that is fully described within the [JAG Technical Report](#). Once each fiscal year's overall JAG Program funding level is determined, BJA works with the Bureau of Justice Statistics to begin a four-step grant award calculation process, which, in general, consists of:

1. Computing an initial JAG allocation for each state, based on its share of violent crime and population (weighted equally).
2. Reviewing the initial JAG allocation amount to determine if the state allocation is less than the minimum award amount defined in the JAG legislation (0.25 percent of the total). If this is the case, the state is funded at the minimum level, and the funds required for this are deducted from the overall pool of JAG funds. Each of the remaining states receives the minimum award plus an additional amount based on its share of violent crime and population.
3. Dividing each state's final award amount (except for the territories and the District of Columbia) between the state and its units of local governments at rates of 60 and 40 percent, respectively.
4. Determining award allocations for the units of local government, which are based on their proportion of the state's 3-year violent crime average. If the "eligible award amount" for a particular unit of local government, as determined on this basis, is \$10,000 or more, then the unit of local government is eligible to apply directly to OJP (under the JAG Local Solicitation) for a JAG award. If the "eligible award

amount” for a particular unit of local government, as determined on this basis, is less than \$10,000, the funds are not made available for a direct award to that particular unit of local government, but instead are added to the amount that is awarded to the state.

Allocation Determination and Units of Local Government Requirements Regarding Use of JAG Funds

Eligible allocations under JAG are posted annually on the [JAG web page](#).

According to the JAG Program statute, a “disparity” may exist between the funding eligibility of a county and its associated municipalities. See [34 U.S.C. § 10156\(d\)\(4\)](#). Units of local government identified by BJA as disparate must select a fiscal agent that will submit an application for the allocation to include all disparate municipalities. A memorandum of understanding (MOU) that identifies which jurisdiction will serve as the applicant or fiscal agent for joint funds must be completed and signed by each participating jurisdiction’s authorized representative. Once an award is made, the fiscal agent will be responsible for distributing award funds to the other jurisdictions in the disparate group through subawards that include all appropriate award conditions. To verify eligibility, an applicant should visit the [JAG web page](#) and click on their respective state and note the following regarding the state’s allocation table:

1. Disparate units of local government are listed in shaded groups, in alphabetic order by county. Units of local government identified as disparate must select one unit of local government to submit an application on behalf of the disparate group.
2. Counties that have an asterisk (*) under the “Direct Allocation” column did not submit the level of violent crime data to qualify for a direct award from BJA but are in the disparate grouping indicated by the shaded area. The JAG legislation requires these counties to remain a partner with the local jurisdictions receiving funds and must be a signatory on the required MOU.
3. Direct allocations are listed alphabetically below the shaded disparate groupings.

Please note that disparate jurisdictions do not need to abide by the listed individual allocations, which are provided for information only. Jurisdictions in a funding disparity are responsible for determining individual amounts within the Eligible Joint Allocation and documenting individual allocations in the MOU. See the [JAG FAQs](#) for more information. A [sample MOU](#) is also available.

Statutory Program Areas

In general, JAG funds awarded to a unit of local government under the FY 2023 program may be used to hire additional personnel and/or purchase equipment, supplies, contractual support, training, technical assistance, and information systems for criminal justice or civil proceedings, including for any one or more of the following program areas:

1. Law enforcement programs.

2. Prosecution and court programs.
3. Prevention and education programs.
4. Corrections and community corrections programs.
5. Drug treatment and enforcement programs.
6. Planning, evaluation, and technology improvement programs.
7. Crime victim and witness programs (other than compensation).
8. Mental health programs and related law enforcement and corrections programs, including behavioral programs and crisis intervention teams.
9. Implementation of state crisis intervention court proceedings and related programs or initiatives, including, but not limited to, mental health courts, drug courts, veterans courts, and extreme risk protection order programs.

In connection with all of the above purposes, it should be noted that the statute defines “criminal justice” as “activities pertaining to crime prevention, control, or reduction, or the enforcement of the criminal law, including, but not limited to, police efforts to prevent, control, or reduce crime or to apprehend criminals, including juveniles, activities of courts having criminal jurisdiction, and related agencies (including but not limited to prosecutorial and defender services, juvenile delinquency agencies and pretrial service or release agencies), activities of corrections, probation, or parole authorities and related agencies assisting in the rehabilitation, supervision, and care of criminal offenders, and programs relating to the prevention, control, or reduction of narcotic addiction and juvenile delinquency.”

BJA Areas of Emphasis

BJA recognizes that many state and local justice systems currently face challenging fiscal environments and an important, cost-effective way to relieve those pressures is to share or leverage resources through cooperation among federal, state, and local law enforcement. Key areas of priority for BJA include advancing justice system reform efforts, advancing racial equity and support for underserved communities, preventing and combating hate crimes, crime and violence reduction strategies, and community violence intervention (CVI) approaches. BJA encourages recipients of FY 2023 JAG funds to consider coordination with federal law enforcement agencies and other stakeholders, including communities most impacted by crime and violence, in addressing these challenges. Additional details on the BJA areas of emphasis can be found below:

Advancing Justice System Reform Efforts

The justice system serves an important role in protecting communities and seeking justice for victims. For the justice system to serve that role effectively, it must be fair, open, and equitable; utilize evidence-based approaches; and promote restorative practices and rehabilitation. For far too long, however, the justice system has not lived up to its promise. Racial bias and injustice and overly harsh sentences have swelled correctional populations which not only exacerbates distrust in the justice system, but also destabilizes the wellbeing of communities. To build strong, safe, and healthy communities, it is critical to address the underlying,

entrenched issues of inequity and disparity in the criminal justice system so that all persons receive equal treatment under the law. Jurisdictions must carefully review the ways in which the structures and incentives within their own systems are driving correctional populations and racial disparities and realign operations and target resources toward community solutions.

Consistent with President Biden's [Executive Order 14074](#), Advancing Effective, Accountable Policing and Criminal Justice Practices To Enhance Public Trust and Public Safety, and the [Safer America Plan](#), DOJ is committed to advancing bold, effective justice reform solutions that deliver safety, equity, and justice for all. Justice system reform includes, but is not limited to, a wide range of investments in community safety and justice such as accountability of law enforcement to build community trust, alternatives to incarceration, community supervision reforms, support for mental health and substance use treatment services, community-driven programs and partnerships, and enhancing pretrial processes. Efforts to continue to address the backlog of court cases created during the pandemic would fall in this category. BJA encourages JAG recipients to utilize funding for projects that promote all aspects of justice system reform.

Advancing Racial Equity and Support for Underserved Communities

Consistent with the Presidential [Memorandum on Restoring the Department of Justice's Access-to-Justice Function and Reinvigorating the White House Legal Aid Interagency Roundtable](#) and [Executive Order 13985](#), Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, DOJ is committed to ensuring equal access to justice and identifying and reducing disparities that exist throughout the criminal and civil legal systems, and to remove barriers to ensure equal opportunity for people of color and for communities that have been historically underserved, marginalized, and adversely affected by inequality. This commitment is evidenced by the April 14, 2022, [Equity Action Plan](#) designed to increase equity, opportunity, and resources for the most vulnerable communities.

BJA encourages JAG recipients to utilize funds to support efforts at the state, territory, local, and tribal levels to institute more effective and equitable criminal justice policies and practices, foster public trust, and enhance public safety and security by increasing engagement with community members and building partnerships with community organizations to develop a shared vision and approach to addressing crime. This includes support for strategies to ensure the protection of defendants' and incarcerated individuals' constitutional rights and safety and efforts to address wrongful convictions and conviction integrity. This also includes supporting technological or personnel upgrades to provide more equitable access to justice, including language access resources, resources to better serve those with disabilities, and indigent defense services. Finally, this can include efforts to build partnerships between the criminal justice system and nonprofits to

provide support for collaborative, community-driven and informed efforts, such as community-based diversion programs outside of the criminal justice system, increasing access to resources to support the right to counsel, and developing community-driven and informed prevention programs or responses to violent crime.

Preventing and Combating Hate Crimes

Hate crimes (sometimes called bias-motivated crimes) are criminal offenses motivated by some form of bias toward victims based on their perceived or actual race, color, ethnicity, religion, national origin, sexual orientation, gender, gender identity, or disability. Hate crimes have a devastating effect beyond the harm inflicted on any one victim. They reverberate through families, communities, and the entire nation as others fear that they too may be threatened, attacked, or forced from their homes because of what they look like, who they are, where they worship, who they love, or whether they have a disability. As with most other crimes, hate crimes in the United States are primarily investigated under state law and prosecuted by local, state, and tribal authorities. However, reluctance from victims and witnesses to contact law enforcement about hate crime incidents may arise from perceptions of bias, distrust of law enforcement or the criminal justice system, or barriers such as language or concerns about immigration status. Hate crimes are chronically underreported to and under-identified by law enforcement. Tools such as the [U.S. Bureau of Justice Statistics' National Crime Victimization Survey \(NCVS\)](#) and the Federal Bureau of Investigation's (FBI's) Uniform Crime Reporting (UCR) program shed some light on trends among those hate crimes reported to law enforcement or through NCVS. Although hate crimes are often underreported, in recent years, there have been alarming spikes in hate crimes and threats of violence across the country, often fueled by online hate forums. In 2021 and 2022, there were several attacks on houses of worship, threats against Historically Black Colleges and Universities, and increased attacks on Asian Americans. Though many jurisdictions are facing significant increases in hate crimes and hate incidents, [a recent research study and survey from the National Institute of Justice \(NIJ\)](#) indicates that many state and local law enforcement agencies do not have adequate tools to identify, investigate, and respond to hate crimes, and only 23 percent of law enforcement agencies that responded to the survey reported any hate crime investigations in 2018.

In September 2022, Attorney General Merrick Garland [announced that all 94 U.S. Attorneys' offices](#) would be implementing the United Against Hate Program and emphasized that eliminating hate and bias-motivated crimes is one of DOJ's top priorities, and combating hate crimes and promoting trust and accountability in law enforcement was one of the Department's priority goals for fiscal year 2023. BJA encourages JAG recipients to utilize funding to promote change and accountability by supporting state, local, and tribal efforts to prevent hate crimes, improve data collection and reporting of hate-related criminal offenses and incidents, and promote efforts to fully investigate and prosecute hate crimes when they do occur.

This includes ensuring those agencies that have not yet transitioned to the National Incident Based Reporting System (NIBRS) do so expeditiously to ensure that national hate crime statistics are as accurate as possible. More information on BJA's portfolio addressing hate crimes, including the [Emmett Till Cold Case Investigations](#) and [Matthew Shepard and James Byrd, Jr. Hate Crimes](#) programs, can be found at: [Hate Crime | Bureau of Justice Assistance \(ojp.gov\)](#).

Crime and Violence Reduction Strategies

The Biden–Harris Administration and DOJ have made crime and violence reduction a top priority. In May 2022, President Biden signed [Executive Order 14074](#), Advancing Effective, Accountable Policing and Criminal Justice Practices to Enhance Public Trust and Public Safety, which states, “since early 2020, communities around the country have faced rising rates of violent crime, requiring law enforcement engagement at a time when law enforcement agencies are already confronting challenges of staffing shortages and low morale.” According to an analysis of 27 cities conducted by the Council on Criminal Justice, the number of homicides in 2022 declined 4 percent over 2021, yet the homicide rate remained 34 percent higher than 2019 levels. Also, preliminary data compiled by the [National Law Enforcement Officers Memorial Fund](#) indicate that as of December 31, 2022, 226 federal, state, tribal, and local law enforcement officers died in the line of duty in 2022. Line-of-duty-related deaths continue to be a top concern. Sixty-four law enforcement officers were killed feloniously by firearms in 2022, which is an increase over the historical number of deaths by gunfire seen in the prior decade (2010–2020 saw an average of 53).

BJA encourages JAG grantees to invest funds to tailor programs and responses to state and local crime issues through the use of data and analytics; coordinate with United States Attorneys and Project Safe Neighborhoods grantees in order to leverage funding for crime and violence reduction projects and coordinate their law enforcement activities with those of federal law enforcement agencies such as the FBI, the Bureau of Alcohol, Tobacco, Firearms and Explosives, the Drug Enforcement Administration, the United States Marshals Service, and the Department of Homeland Security; and form partnerships with federal, state, and local law enforcement and prosecutors to identify persons who use guns to commit a crime and who purchase or sell guns illegally. This includes ensuring that persons prohibited from purchasing firearms (see e.g., 18 U.S.C. § 922(g)) are deterred from doing so by enhancing complete, accurate, and timely access to the FBI's National Instant Criminal Background Check System (NICS) and the timely submission of all necessary records into the FBI databases, which will help prevent illegal transfers of firearms to those who are prohibited from owning firearms under current law. BJA also encourages JAG grantees to invest in implementing programs that provide training, assistance, and resources to law enforcement agencies to mitigate the current crisis in law enforcement recruitment and retention, bolster the security of at-risk places of worship such as synagogues, churches, and mosques, provide

security for prosecutors and elections, enhanced community policing and crime prevention, enforcement of commonsense gun laws, and upgrade systems and/or purchase technology that support agency strategies to reduce violent crime and enhance their capacity to better address crime.

Community Based Violence Intervention (CVI) Approaches

In April 2021, the [Biden–Harris Administration announced historic investments in CVI](#) efforts to combat the gun violence epidemic. CVI is an approach that uses evidence-informed strategies to reduce violence through tailored, community-centered initiatives. These multidisciplinary strategies engage individuals and groups to prevent and disrupt cycles of violence and retaliation and establish relationships between individuals and community assets to deliver services that save lives, address trauma, provide opportunity, and improve the physical, social, and economic conditions that drive violence. On February 16, 2023, Attorney General Garland [delivered remarks](#) at a convening of grantees under OJP's [Community Based Violence Intervention and Prevention Initiative](#). He emphasized that DOJ's approach to disrupting violent crime is: "centered on our partnerships – both with the communities harmed by violent crime and with the law enforcement agencies that protect those communities. Our approach is centered on building public trust. We know that we cannot do our jobs effectively without the trust of the communities we serve. Our department-wide anti-violent crime strategy leverages the resources of our federal prosecutors, agents, investigators, grant programs, and criminal justice experts towards those ends. We are working closely with local and state law enforcement agencies, with officials across government, and with the communities most affected by this violence, and with the community organizations on the front lines – all toward one goal: the goal of making our communities safer."

BJA encourages JAG recipients to invest JAG funds to tailor programs to build strong, sustained partnerships with community residents and organizations to support CVI work in communities most impacted by violent crime. CVI strategies typically focus on high-risk individuals and gang and gun violence as well as the historical and structural challenges that often contribute to community violence. CVI strategies should involve holistic, coordinated interventions attending to the multiple needs of individuals at high risk of gang and gun violence. For example, hospital-based violence intervention programs use credible messengers to connect with victims of gun violence while they are still in the hospital, and then wraparound services are typically provided to them such as behavioral health support, employment access, housing advocacy, and family support. More information on CVI strategies is available through [BJA's National Training and Technical Assistance Center \(NTTAC\)](#) and on BJA's website at: <https://bjaojp.gov/program/community-violence-intervention/overview>. BJA encourages JAG recipients to partner with organizations with existing CVI strategies to support and enhance those programs, which may include organizations funded under OJP's Community Based Violence Intervention and Prevention Initiative (CVIPI). To identify and learn

more about existing CVIPI grantees, review [OJP's CVIPI web page](#) and FY 2022 CVIPI award information. In addition, jurisdictions looking to implement those strategies can request training and technical assistance (TTA) on the [NTTAC website](#).

Additional Uses of JAG Funds

JAG funds awarded under this FY 2023 solicitation may also be used to:

- Support reentry projects with the goal of improving outcomes for incarcerated individuals returning to the community from prison or jail.
- Support projects related to preventing, detecting, seizing, and/or stopping the presence and use of contraband cellphones within correctional facilities. This includes the purchasing of managed access systems and other mitigation technologies (as permitted by applicable law).
- Purchase fentanyl and methamphetamine detection equipment, including handheld instruments and training for law enforcement safety, as well as opioid reversal agents.
- Purchase drug-detection canines to combat the rise of drug trafficking, including that of methamphetamines.
- Support efforts to seal and expunge criminal history information in accordance with state laws and policies.
- Support efforts to attract and retain an all-inclusive, diverse, expert, and accountable law enforcement workforce, with a focus on gender and racial diversity.
- Support virtual reality de-escalation training.
- Purchase humane remote restraint devices that enable law enforcement to restrain an uncooperative subject without inflicting pain.
- Purchase gunfire detection technology.
- Promote data sharing and sex offender monitoring.

Additionally, JAG funds awarded under this FY 2023 solicitation may be used for any purpose indicated here: [Purposes for Which Funds Awarded Under the Edward Byrne Memorial Justice Assistance Grants \(JAG\) Program May Be Used \(ojp.gov\)](#).

Limitations on the Use of JAG funds

Administrative Costs — Up to 10 percent of a JAG award, including up to 10 percent of any earned interest, may be used for costs associated with administering the award, which can include indirect costs.

Supplanting — JAG funds may not be used to supplant state or local funds but must be used to increase the amount of such funds that would, in the absence of federal funds, be made available. See the [JAG FAQs](#) for examples of supplanting. Although supplanting is prohibited, BJA encourages the leveraging of federal funding.

Matching Funds — Absent specific federal statutory authority to do so, JAG award funds may not be used as a match for other federal awards.

Prohibited and Controlled Equipment and Associated Procedures under JAG — The JAG statute, at [34 U.S.C. § 10152\(d\)](#), specifically identifies a list of prohibited items. In addition, consistent with [Executive Order 14074](#), Advancing Effective, Accountable Policing and Criminal Justice Practices To Enhance Public Trust and Public Safety of May 25, 2022, the use of OJP grant funds for the purchase or transfer of certain equipment has been designated as prohibited or controlled starting with FY 2023 OJP grant funds. Details and associated procedures for requesting prior approval, where applicable, can be found in the [JAG Prohibited and Controlled Equipment Guidance](#) and the [JAG FAQs](#).

Note: The use of BJA grant funds for unmanned aircraft systems (UAS), including unmanned aircraft vehicles (UAV) and/or any accompanying accessories to support UAS or UAV devices/systems, is unallowable.

Other Program Requirements

A unit of local government that applies for and receives an FY 2023 JAG award must note the following:

Trust Fund — Units of local government may draw down JAG funds either in advance or on a reimbursement basis. To draw down in advance, a trust fund must be established in which to deposit the funds. The trust fund must be in an interest-bearing account, unless one of the exceptions in 2 C.F.R. § 200.305(b)(8) apply. If subrecipients draw down JAG funds in advance, they also must establish a trust fund in which to deposit the funds. For additional information, see [2 C.F.R. § 200.305](#).

Minimum Requirements for Extreme Risk Protection Order Programs (ERPOs) — ERPOs must include, at a minimum—

1. Pre-deprivation and post-deprivation due process rights that prevent any violation or infringement of the Constitution of the United States, including, but not limited to, the Bill of Rights and the substantive or procedural due process rights guaranteed under the fifth and 14th amendments to the Constitution of the United States, as applied to the states and as interpreted by state courts and United States courts (including the Supreme Court of the United States). Such programs must include, at the appropriate phase to prevent any violation of constitutional rights, at minimum, notice, the right to an in-person hearing, an unbiased adjudicator, the right to know opposing evidence, the right to present evidence, and the right to confront adverse witnesses.
2. The right to be represented by counsel at no expense to the government.
3. Pre-deprivation and post-deprivation heightened evidentiary standards and proof which mean not less than the protections afforded to a similarly situated litigant in

federal court or promulgated by the state's evidentiary body, and sufficient to ensure the full protections of the Constitution of the United States, including, but not limited to, the Bill of Rights and the substantive and procedural due process rights guaranteed under the fifth and 14th amendments to the Constitution of the United States, as applied to the states and as interpreted by state courts and United States courts (including the Supreme Court of the United States). The heightened evidentiary standards and proof under such programs must, at all appropriate phases to prevent any violation of any constitutional right, at minimum, prevent reliance upon evidence that is unsworn or unaffirmed, irrelevant, based on inadmissible hearsay, unreliable, vague, speculative, and lacking a foundation.

4. Penalties for abuse of the program.

Certifications and Assurances by the Chief Executive of the Applicant Government (which incorporates the 30-day governing body review requirement) — A JAG application is not complete, and a unit of local government may not access award funds, unless the chief executive of the applicant unit of local government (e.g., the mayor) properly executes, and the unit of local government submits, the “Certifications and Assurances by the Chief Executive of the Applicant Government.” The most up-to-date version of this certification can be found at: [FY23 JAG - Certifications and Assurances by the Chief Executive of the Applicant Government](#). Please note that this certification contains assurances that the governing body notification and public comment requirements, which are required under the JAG statute (at 34 U.S.C. § 10153(a)(2)), have been satisfied.

OJP will not deny an application for an FY 2023 award for failure to submit these “Certifications and Assurances by the Chief Executive of the Applicant Government” by the application deadline, but a unit of local government will not be able to access award funds (and its award will include a condition that withholds funds) until it submits these certifications and assurances properly executed by its respective chief executive (e.g., the mayor).

Body-worn Cameras (BWCs) — A JAG award recipient that proposes to use FY 2023 funds to purchase BWC equipment or implement or enhance BWC programs must provide to OJP a certification(s) that each direct recipient receiving the equipment or implementing the program has policies and procedures in place related to BWC equipment usage, data storage and access, privacy considerations, and training. The certification form related to BWC policies and procedures can be found at: [JAG - Body-Worn Camera \(BWC\) Policy Certification](#).

A JAG award recipient that proposes to use funds for BWC-related expenses will have funds withheld until the required certification is submitted and approved by OJP. If the JAG award recipient proposes to change project activities to utilize JAG funds for BWC-related expenses after the award is accepted, the JAG award recipient must submit the signed certification to OJP at that time.

Further, before making any subaward for BWC-related expenses, the JAG award

recipient must collect a completed BWC certification from the proposed subrecipient. Any such certifications must be maintained by the JAG award recipient and made available to OJP upon request. The [BJA BWC Toolkit](#) provides model BWC policies and best practices to assist criminal justice departments in implementing BWC programs.

Apart from the JAG Program, BJA provides funds under the [Body-worn Camera Policy and Implementation Program](#) (BWCPPI). BWCPPI allows jurisdictions to develop and implement policies and practices required for effective program adoption, and to address program factors including the purchase, deployment, and maintenance of camera systems and equipment; data storage and access; and privacy considerations. Interested JAG award recipients may wish to refer to the [BWC Partnership Program web page](#) for more information. JAG award recipients that are also BWC award recipients may not use JAG funds for any part of the 50 percent match required by the BWC Program.

Body Armor — Body armor purchased with JAG funds may be purchased at any threat level, make, or model from any distributor or manufacturer, as long as the following requirements are met: The body armor must have been tested and found to comply with the latest applicable National Institute of Justice ballistic or stab standards (<https://cjtcc.org/compliance-testing-program/compliant-product-lists/>). In addition, body armor purchased must be made in the United States.

Body armor purchased with JAG funds must be “uniquely fitted vests,” which means protective (ballistic or stab-resistant) armor vests that conform to the individual wearer to provide the best possible fit and coverage through a combination of (1) correctly sized panels and carrier determined through appropriate measurement and (2) properly adjusted straps, harnesses, fasteners, flaps, or other adjustable features. Note that the requirement that body armor be “uniquely fitted” does not necessarily require body armor that is individually manufactured based on the measurements of an individual wearer. In support of OJP’s efforts to improve officer safety, the American Society for Testing and Materials (ASTM) International has made available the Standard Practice for Body Armor Wearer Measurement and Fitting of Armor ([Active Standard ASTM E3003](#)) at no cost. The [Personal Armor Fit Assessment Checklist](#) is excerpted from ASTM E3003.

A JAG award recipient that proposes to use FY 2023 award funds to purchase body armor must provide OJP with a certification(s) that each law enforcement agency receiving body armor has a written “mandatory wear” policy in effect (see [34 U.S.C. § 10202\(c\)](#)). The certification form related to mandatory wear can be found at: [JAG - Body Armor Mandatory Wear Policy Certification](#). Note: A JAG award recipient that proposes to use funds for the purchase of body armor will have funds withheld until the required certification is submitted and approved by OJP. If the JAG award recipient proposes to change project activities to utilize funds for the purchase of body armor after the award is accepted, the award recipient must submit the signed certification to OJP at that time.

Further, before making any subaward for the purchase of body armor, the JAG award recipient must collect a completed mandatory wear certification from the proposed

subrecipient. Any such certifications must be maintained by the JAG award recipient and made available to OJP upon request. A mandatory wear concept and issues paper and a model policy are available from the BVP Customer Support Center, which can be contacted at vests@usdoj.gov or toll free at 1-877-758-3787. Additional information and FAQs related to the mandatory wear policy and certifications can be found in the [JAG FAQs](#).

Apart from the JAG Program, BJA provides funds under the Patrick Leahy Bulletproof Vest Partnership (BVP) Program. The BVP Program provides funding to state and local law enforcement agencies for the purchase of ballistic-resistant and stab-resistant body armor. For more information on the BVP Program, including eligibility and an application, refer to the [BVP webpage](#). JAG award recipients should note, however, that funds may not be used for any part of the 50 percent match required by the BVP Program.

Death in Custody Reporting Act (DCRA) — The Death in Custody Reporting Act of 2013 (Public Law 113-242) requires states to report to the Attorney General information regarding the death of any person who is detained, under arrest, in the process of being arrested, en route to be incarcerated, or incarcerated at a municipal or county jail, state prison, state-run boot camp prison, boot camp prison that is contracted by the state, any state or local contract facility, or other local or state correctional facility (including any juvenile facility). To comply with DCRA, JAG State Administering Agencies (SAAs) are responsible for collecting data on a quarterly basis from local entities including local jails, law enforcement agencies, medical examiners, and other state agencies and submitting the data to BJA. Units of local government are strongly encouraged to cooperate with DCRA data collection efforts within their state.

Interoperable Communications — Units of local government (including any subrecipients) that are using FY 2023 JAG funds for emergency communications activities should comply with the SAFECOM Guidance for Emergency Communication Grants (SAFECOM Guidance), including provisions on technical standards that ensure and enhance interoperable communications. The SAFECOM Guidance is an essential resource for entities applying for federal financial assistance for emergency communications projects. It provides general information on eligible activities, technical standards, and other terms and conditions that are common to most federal emergency communications programs. Specifically, the SAFECOM Guidance provides guidance to applicants on:

- Recommendations for planning, coordinating, and implementing projects.
- Emergency communications activities that can be funded through federal grants.
- Best practices, policies, and technical standards that help to improve interoperability.
- Resources to help grant recipients comply with technical standards and grant requirements.

SAFECOM Guidance is recognized as the primary guidance on emergency communications grants by the Administration, Office of Management and Budget, and federal grant program offices. The Cybersecurity & Infrastructure Security Agency (CISA) updates the document every year in close coordination with federal, state, local, tribal, and territorial stakeholders, and partners. SAFECOM Guidance is applicable to all federal grants funding emergency communications. The most recent version of the SAFECOM Guidance is available at: <https://www.cisa.gov/safecom/funding>.

Additionally, emergency communications projects funded with FY 2023 JAG funds should support the Statewide Communication Interoperability Plan (SCIP) and be coordinated with the full-time statewide interoperability coordinator (SWIC) in the state of the project. As the central coordination point for a state's interoperability effort, the SWIC plays a critical role and can serve as a valuable resource. SWICs are responsible for the implementation of SCIP through coordination and collaboration with the emergency response community. CISA maintains a list of SWICs for each state and territory. Contact ecd@cisa.dhs.gov for more information. All communications equipment purchased with FY 2023 JAG Program funding should be identified during the quarterly performance measurement reporting.

DNA Testing of Evidentiary Materials and Uploading DNA Profiles to a Database — If JAG Program funds are to be used for DNA testing of evidentiary materials, any resulting eligible DNA profiles must be uploaded to the Combined DNA Index System (CODIS), the national DNA database operated by the FBI, by a government DNA lab with access to CODIS. No profiles generated with JAG funding may be entered into any other nongovernmental DNA database without prior written approval from BJA (exceptions include forensic genealogy). Additionally, award recipients utilizing JAG funds for forensic genealogy testing must adhere to the DOJ Interim Policy Forensic Genealogical DNA Analysis and Searching available at: <https://www.justice.gov/olp/page/file/1204386/download>. For more information about DNA testing as it pertains to JAG, please refer to the [JAG FAQs](#).

Entry of Records into State Repositories — As appropriate and to the extent consistent with law, a special condition will be imposed that would require the following: Any program or activity that receives federal financial assistance under JAG that is likely to generate court dispositions or other records relevant to NICS determinations, including any dispositions or records that involve any noncitizen or migrant who is undocumented in the United States (18 U.S.C. § 922(g)(5)(A), must have a system in place to ensure that all such NICS-relevant dispositions or records are made available in a timely fashion.

National Incident-based Reporting System — In FY 2016, the FBI formally announced its intention to sunset the UCR program's traditional Summary Reporting System (SRS) and replace it with NIBRS by January 1, 2021. By statute, BJA JAG awards are calculated using summary part 1 violent crime data from the FBI's UCR program. Specifically, the formula allocations for JAG rely heavily on the ratio of "the average number of part 1

violent crimes of the UCR of the FBI reported by such State for the three most recent years reported by such State to the average annual number of such crimes reported by all States for such years” (34 U.S.C. 10156(a)(1)(B)). In preparation for the FBI’s 2021 NIBRS compliance deadline, BJA imposed an administrative requirement for JAG award recipients that are not NIBRS compliant to dedicate 3 percent of their JAG award toward coming into full compliance with the FBI’s NIBRS data submission requirement to both encourage and assist jurisdictions in working toward compliance and ensure they continue to have critical criminal justice funding available through JAG when SRS transitioned to NIBRS. A NIBRS set-aside is NOT required for FY 2023 awards; however, JAG recipients are encouraged to continue working toward and/or maintaining NIBRS compliance to ensure that JAG eligibility is not affected in future fiscal years. Local jurisdictions that are seeking NIBRS compliance certification should reach out directly to their respective state agency. Agencies with questions about the certification process may contact ucr-nibrs@fbi.gov. More information about NIBRS, including toolkits and updates from the FBI Criminal Justice Information Services team, can be found at: [NIBRS — FBI](#).

Goals, Objectives, and Deliverables

Goals

In general, the FY 2023 JAG Program is designed to provide units of local government with additional personnel, equipment, supplies, contractual support, training, technical assistance, and information systems for criminal justice and civil proceedings.

Objectives

The objectives are directly related to the JAG Program accountability measures described at: <https://bja.ojp.gov/sites/g/files/xyckuh186/files/media/document/jag-pmt-accountability-measures.pdf>.

A unit of local government that receives an FY 2023 JAG award will be required to produce various types of reports including quarterly performance reports in BJA’s Performance Measurement Tool (PMT), quarterly financial reports in JustGrants, and semi-annual progress reports in JustGrants.

The Goals, Objectives, and Deliverables are directly related to the performance measures that show the completed work’s results, as discussed in the Application and Submission Information section.

Evidence-Based Programs

OJP strongly encourages the use of data and evidence in policymaking and program development for criminal justice, juvenile justice, and crime victim services. For additional information and resources on evidence-based programs or practices, see the [OJP Grant Application Resource Guide](#).

Information Regarding Potential Evaluation of Programs and Activities

OJP may conduct or support an evaluation of the programs and activities funded under this solicitation. For additional information and applicable documentation to be included in the application, see the [OJP Grant Application Resource Guide](#) section entitled "Information Regarding Potential Evaluation of Programs and Activities."

Federal Award Information

General Guidance for Federal Award

Anticipated number of awards BJA expects to make:1296

Anticipated maximum dollar amount for each award: \$4,660,745

Period of performance start date: October 1, 2022

Period of performance duration: 24 - 48 months

Anticipated Total amount to be awarded under solicitation: \$102,778,619

Category 1 — Eligible Allocation Amounts of Less than \$25,000: Units of local government that are listed on the JAG web page as eligible for an allocation amount of less than \$25,000 should apply under Category 1. This includes direct and joint (disparate) allocations. Category 1 awards of less than \$25,000 are 2 years in length. Extensions of up to 2 years can be requested for these awards via JustGrants no fewer than 30 days prior to the project period end date and will be automatically granted upon request.

Category 2 — Eligible Allocation Amounts of \$25,000 or More: Units of local government that are listed on the JAG web page as eligible for an allocation amount of \$25,000 or more should apply under Category 2. This includes direct and joint (disparate) allocations. Category 2 awards of at least \$25,000 are 4 years in length. Extensions beyond this period may be made on a case-by-case basis at the discretion of BJA and must be requested via JustGrants no fewer than 30 days prior to the project period end date.

Solicitation Categories

Competition ID	Category *	Number of Awards	Dollar Amount for Award	Performance Start Date	Performance Duration (Months)
C-BJA-2023-00104-PROD	Category 1– Applicants with eligible allocation amounts of less than \$25,000	678	\$10,420,302	10/1/22 12:00 AM	24
	Category				

C-BJA-2023-00105-PROD	2–Applicants with eligible allocation amounts of \$25,000 or more	618	92,358,317	10/1/22 12:00 AM	48
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Awards, Amounts and Durations

Type of Award

BJA expects to make awards under this solicitation as grants. See the “Administrative, National Policy, and Other Legal Requirements” section of the [OJP Grant Application Resource Guide](#) for a brief discussion of important statutes, regulations, and award conditions that apply to many (or in some cases, all) OJP grants.

Financial Management and System Controls

Award recipients and subrecipients (including recipients or subrecipients that are pass-through entities) must, as described in the Part 200 Uniform Requirements as set out at 2 C.F.R. 200.303, comply with standards for financial and program management. See the [OJP Grant Application Resource Guide](#) for additional information.

Budget Information

This solicitation expressly modifies the [OJP Grant Application Resource Guide](#) by not incorporating the “Limitation on Use of Award Funds for Employee Compensation; Waiver” provision in the “Financial Information” section of the [OJP Grant Application Resource Guide](#).

General requirement for federal authorization of any subaward; statutory authorization of subawards under the JAG Program statute. Generally, a recipient of an OJP award may not make subawards (“subgrants”) unless the recipient has specific federal authorization to do so. Unless an applicable statute or DOJ regulation specifically authorizes (or requires) particular subawards, a recipient must have authorization from OJP before it may make a subaward. However, JAG subawards that are required or specifically authorized by statute (see [34 U.S.C. § 10152\(a\)](#) and [34 U.S.C. § 10156](#)) do not require prior approval. For additional information regarding subawards and authorizations, please refer to the subaward section in the [OJP Grant Application Resource Guide](#).

The use of BJA grant funds for unmanned aircraft systems (UAS), including unmanned aircraft vehicles (UAV), and/or any accompanying accessories to support UAS or UAV devices/systems, is unallowable.

Cost Sharing or Matching Requirement

This solicitation does not require a match.

Pre-agreement Costs (also known as Pre-award Costs)

See the [OJP Grant Application Resource Guide](#) for information on Pre-agreement Costs (also known as Pre-award Costs).

Prior Approval, Planning, and Reporting of Conference/Meeting/Training Costs

See the [OJP Grant Application Resource Guide](#) for information on Prior Approval, Planning, and Reporting of Conference/Meeting/Training Costs.

Costs Associated with Language Assistance (if applicable)

See the [OJP Grant Application Resource Guide](#) for information on Costs Associated with Language Assistance.

Availability of Funds

This solicitation, and awards under this solicitation, are subject to the availability of appropriated funds and to any modifications or additional requirements that may be imposed by the agency or by law. In addition, nothing in this solicitation is intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

The allocations by state for the FY23 JAG Program can be found at: <https://bja.ojp.gov/program/jag/fy-2023-allocations>.

Eligibility Information

For eligibility information, see the solicitation cover page.

For information on cost sharing or matching requirements, see the "Federal Award Information" section.

All recipients and subrecipients (including any for-profit organization) must forgo any profit or management fee.

Application and Submission Information

Content of Application Submission

See the “Application Elements and Formatting Instructions” section of the [OJP Grant Application Resource Guide](#) for information on what happens to an application that does not contain all the specified elements or is nonresponsive to the scope of the solicitation.

Information to Complete the Application for Federal Assistance (SF-424) in Grants.gov

The SF-424 must be submitted in Grants.gov. It is a required standard form used as a cover sheet for submission of pre-applications, applications, and related information. See the [OJP Grant Application Resource Guide](#) for additional information on completing the SF-424.

In Section 8F of the SF-424, please include the name and contact information of the individual **who will complete the application in JustGrants**. JustGrants will use this information (*email address*) to assign the application to this user in JustGrants.

Intergovernmental Review: This solicitation (“funding opportunity”) is subject to [Executive Order 12372](#). An applicant may find the names and addresses of State Single Points of Contact (SPOCs) at the following website: <https://www.whitehouse.gov/wp-content/uploads/2020/04/SPOC-4-13-20.pdf>. If the applicant’s State appears on the SPOC list, the applicant must contact its SPOC to find out about, and comply with, the State’s process under E.O. 12372. On the SF-424, an applicant whose State appears on the SPOC list is to make the appropriate selection in response to question 19, once the applicant has complied with its State E.O. 12372 process. An applicant whose State does not appear on the SPOC list should answer question 19 by selecting “Program is subject to E.O. 12372 but has not been selected by the State for review.” the SF-424, an applicant whose State appears on the SPOC list is to make the appropriate selection in response to question 19, once the applicant has complied with its State E.O. 12372 process. An applicant whose State does not appear on the SPOC list should answer question 19 by selecting “Program is subject to E.O. 12372 but has not been selected by the State for review.”

Standard Applicant Information (JustGrants 424 and General Agency Information)

The Standard Applicant Information section of the JustGrants application is pre-populated with the SF-424 data submitted in Grants.gov. The applicant will need to review the Standard Applicant Information in JustGrants and make edits as needed. Within this section, the applicant will need to add: zip codes for areas affected by the project; confirm their Authorized Representative; and verify and confirm the organization’s unique entity identifier, legal name, and address.

Proposal Abstract

A brief Proposal Abstract (no more than 100 words), which concisely describes the intended use of JAG funds, must be completed in the JustGrants web-based form. This abstract should be in paragraph form without bullets or tables, written in the third person, and exclude personally identifiable information. Abstracts will be made publicly available on the OJP and USASpending.gov websites if the project is awarded. Examples of brief Proposal Abstracts are included below.

JAG Abstract Examples:

The city of _____ will use JAG funds for overtime for increased patrols to bolster the security of at-risk nonprofit organizations such as synagogues, churches, mosques, and other places of worship.

The county of _____ will use JAG funds to hire credible messengers as part of a community based violence intervention initiative.

Disparate JAG Abstract Example:

The disparate jurisdictions of _____ and _____ will use JAG funds for technology improvements and equipment. Specifically, the county of _____ will use JAG funds to replace its records management system in order to transition to NIBRS, and the city of _____ will use JAG funds to purchase body worn cameras to promote public trust, accountability, and transparency.

Proposal Narrative

The Proposal Narrative should be submitted as an attachment in JustGrants. The attached document should be double-spaced, using a standard 12-point font; have no less than 1-inch margins; and should not exceed 10 numbered pages.

Category 1 — Eligible Allocation Amounts of Less than \$25,000

The proposal narrative for Category 1 applications must include a description of the project(s), including subawards, if applicable, to be funded with JAG funds over the 2-year grant period.

Category 2 — Eligible Allocation Amounts of \$25,000 or More

The proposal narrative for Category 2 applications should include:

a. Description of the Issue

Identify the unit of local government's strategy/funding priorities for the FY 2023 JAG funds, the subaward process (if applicable, including disparities) and

timeline, any progress or challenges, and a description of the programs to be funded over the 4-year grant period.

b. Project Design and Implementation

Describe the unit of local government's process, if any, for engaging stakeholders from across the justice continuum and how that input informs priorities. This should include a description of how local communities are engaged in the planning process, how state and local planning efforts are coordinated, and the challenges faced in coordination. The applicant should identify the stakeholders representing each program area who are participating in the strategic planning process, the gaps in the state's needed resources for criminal justice purposes, plans to improve the administration of the criminal justice system, and how JAG funds will be coordinated with state and related justice funds.

c. Capabilities and Competencies

Describe any additional strategic planning/coordination efforts in which the units of local government participate with other criminal justice entities within the local jurisdiction and/or state. Please provide an overview of any evidence-informed programs that have been implemented successfully and how those programs might inform implementation of strategic plan priorities.

d. Plan for Collecting the Data Required for this Solicitation's Performance Measures

The application should demonstrate the applicant's understanding of the performance data reporting requirements for this grant program and detail how the applicant will gather the required data should it receive funding.

Note: Applicants are **not** required to submit performance data with the application. Rather, performance measure information is included as a notification that award recipients will be required to submit performance data as part of each award's reporting requirements. Some measures are presented as examples, while others are the exact measures that every recipient will be expected to address.

OJP will require each award recipient to submit regular performance data that show the completed work's results. The performance data directly relate to the goals, objectives, and deliverables identified in the "Goals, Objectives, and Deliverables" discussion. Applicants can visit OJP's performance measurement page at www.ojp.gov/performance for an overview of performance measurement activities at OJP.

A list of performance measure questions for this program can be found at: <https://bjapmt.ojp.gov/help/JAGDocs.html>. NOTE: BJA is in the process of reviewing and revising these performance measure questions. Any changes resulting from this

review will be communicated to award recipients.

BJA will require award recipients to submit quarterly performance measure data in BJA's PMT located at <https://bjapmt.ojp.gov> and separately submit a semi-annual performance report in JustGrants. BJA will provide further guidance on the post-award submission process, if selected for award.

Note on Project Evaluations

An applicant that proposes to use award funds through this solicitation to conduct project evaluations must follow the guidance in the "Note on Project Evaluations" section in the [OJP Grant Application Resource Guide](#).

Budget and Associated Documentation

Budget Worksheet and Budget Narrative (attachment)

The applicant will complete the budget worksheet attachment and submit it by uploading it as an attachment in JustGrants. See the [OJP Grant Application Resource Guide](#) for additional information.

The budget narrative and budget worksheet (attachment) are critical elements, and applicants will be unable to successfully submit an application in JustGrants unless an attachment is uploaded in this section. If an applicant does not have a budget to submit at the time of application, an attachment must be uploaded noting as such, and BJA will add the appropriate special condition withholding funds for budget documentation. Please note that the budget narrative should include a full description of all costs, including administrative costs (if applicable).

Indirect Cost Rate Agreement (if applicable)

If applicable, the applicant will upload their indirect cost rate agreement as an attachment in JustGrants. See the [OJP Grant Application Resource Guide](#) for additional information.

This rule does not eliminate or alter the JAG-specific restriction in federal law that states charges for administrative costs may not exceed 10 percent of the award amount, regardless of the approved indirect cost rate.

Financial Management and System of Internal Controls Questionnaire (including applicant disclosure of high-risk status)

The applicant will download the questionnaire, complete it, and upload it as an attachment in JustGrants. See the [OJP Grant Application Resource Guide](#) for additional information and the link to the questionnaire.

Disclosure of Process Related to Executive Compensation

This solicitation expressly modifies the OJP Grant Application Resource Guide by not incorporating its “Disclosure of Process Related to Executive Compensation” provisions. Applicants to this solicitation are not required to provide this disclosure.

Additional Application Components

The applicant will attach the requested documentation in JustGrants.

Research and Evaluation Independence and Integrity Statement

If an application proposes research (including research and development) and/or evaluation, the applicant must demonstrate research/evaluation independence and integrity, including appropriate safeguards, before it may receive award funds. The applicant will upload documentation of its research and evaluation independence and integrity as an attachment in JustGrants. For additional information, see the [OJP Grant Application Resource Guide](#).

Memorandum of Understanding (if applicable)

For disparate jurisdictions, an MOU that identifies which jurisdiction will serve as the applicant or fiscal agent for joint funds must be completed and signed by the authorized representative for each participating jurisdiction. See the Allocation Determination and Units of Local Government Requirements Regarding Use of JAG Funds section and the [JAG FAQs](#) for more information. A [sample MOU](#) is also available.

OJP will not deny an application for an FY 2023 award if the recipient does not submit a properly executed MOU by the application deadline, but the award recipient will not be able to access award funds (and its award will include a condition that withholds funds) until it submits the properly executed MOU.

Certifications and Assurances by the Chief Executive of the Applicant Government

A JAG application is not complete, and a unit of local government may not access award funds, unless the chief executive of the applicant unit of local government (e.g., the mayor) properly executes, and submits, the “Certifications and Assurances by the Chief Executive of the Applicant Government” attached in the section above entitled “Other Program Requirements.” The most up-to-date certification form can be found at: <https://bja.ojp.gov/doc/fy-23-local-jag-ce-certification.pdf>.

Disclosure and Assurances

The applicant will address the following disclosures and assurances.

Disclosure of Lobbying Activities

Complete and submit the SF-LLL in Grants.gov. Once the applicant submits in Grants.gov, this information will pre-pend into JustGrants. See the [OJP Grant Application Resource Guide](#) for additional information.

DOJ Certified Standard Assurances

Review and accept the DOJ Certified Standard Assurances in JustGrants. See the [OJP Grant Application Resource Guide](#) for additional information.

Applicant Disclosure of Duplication in Cost Items

Complete the JustGrants web-based Applicant Disclosure of Duplication in Cost Items form. See the [OJP Grant Application Resource Guide](#) for additional information.

DOJ Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; and Drug-Free Workplace Requirements; Law Enforcement and Community Policing

Review and accept the DOJ Certified Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; Drug-Free Workplace Requirements; and Law Enforcement and Community Policing in JustGrants. See the [OJP Grant Application Resource Guide](#) for additional information.

Applicant Disclosure and Justification – DOJ High Risk Grantees (if applicable)

If applicable, submit the DOJ High Risk Disclosure and Justification as an attachment in JustGrants. A DOJ High Risk Grantee is an award recipient that has received a DOJ High Risk designation based on a documented history of unsatisfactory performance; financial instability; management system or other internal control deficiencies; noncompliance with award terms and conditions on prior awards, or is otherwise not responsible. See the [OJP Grant Application Resource Guide](#) additional information.

How to Apply

Registration: Before submitting an application, all applicants must register with the System for Award Management (SAM). You must renew and validate your registration every 12 months. If you do not renew your SAM registration, it will expire. An expired registration can delay or prevent application submission in Grants.gov and JustGrants. Registration and renewal can take up to 10 business days to complete.

Submission: Applications must be submitted to DOJ electronically through a two-step

process via Grants.gov and JustGrants.

Step 1: After registering with SAM, the applicant must submit the **SF-424** and **SF-LLL** in Grants.gov at <https://www.grants.gov/web/grants/register.html> by the Grants.gov deadline. **Submit the SF-424 and SF-LLL as early as possible, but no later than 48 hours before the Grants.gov deadline.** If an applicant fails to submit in Grants.gov, they will be unable to apply in JustGrants.

Step 2: The applicant must then submit the **full application** including attachments in JustGrants at JustGrants.usdoj.gov by the JustGrants deadline.

Within 24 hours after receipt of confirmation emails from Grants.gov, the individual in Section 8F of the SF-424 will receive an email from DIAMD-NoReply@usdoj.gov with instructions on how to create a JustGrants account. Register the Entity Administrator and the Application Submitter with JustGrants as early as possible but no later than 48-72 hours before the JustGrants deadline. Once registered in JustGrants, the Application Submitter will receive an emailed link to complete the rest of the application in JustGrants. The Entity Administrator also will need to log into JustGrants to review and invite the applicant's Authorized Representative(s) before an application can be submitted.

Submit the complete application package in JustGrants at least 24 – 48 hours prior to the JustGrants deadline. Some of the application components will be entered directly into JustGrants, and others will require uploading attached documents. Therefore, applicants will need to allow ample time before the JustGrants deadline to prepare each component. Applicants may save their progress in the system and revise the application as needed prior to hitting the Submit button at the end of the application in JustGrants.

For additional information, see the “How to Apply” section in the [OJP Grant Application Resource Guide](#) and the [DOJ Application Submission Checklist](#).

Submission Dates and Time

The **SF-424** and the **SF-LLL** must be submitted in Grants.gov by 10/23/2023 8:59 PM, ET.

The **full application** must be submitted in JustGrants by 10/24/2023 8:59 PM, ET.

OJP urges applicants to submit their Grants.gov and JustGrants submissions prior to the due dates with sufficient time to correct any errors and resubmit by the submission deadlines if a rejection notification is received. To be considered timely, the **full application** must be submitted in JustGrants by the JustGrants application deadline. Failure to begin the SAM.gov, Grants.gov, or JustGrants registration process in sufficient

time (i.e., waiting until the date identified in this solicitation) is not an acceptable reason for late submission.

Experiencing Unforeseen Technical Issues Preventing Submission of an Application

OJP will only consider a request to submit an application after the deadline when the applicant can document that a technical issue with a government system prevented application submission.

If an applicant misses a deadline due to unforeseen technical issues with SAM.gov, Grants.gov, or JustGrants, the applicant may request a waiver to submit an application after the deadline. However, the waiver request will not be considered unless it includes a tracking number generated when the applicant contacts the applicable service desks to report technical difficulties. Tracking numbers are generated automatically when an applicant emails the applicable service desks; and for this reason, applicants are encouraged to email the appropriate service desk, even if they also intend to call the service desk for phone support. Experiencing wait times for phone support does not relieve the applicant of the responsibility of getting a tracking number.

An applicant experiencing technical difficulties must contact the associated service desk indicated below to report the technical issue and receive a tracking number:

- SAM.gov - contact the [SAM Help Desk \(Federal Service Desk\)](#), Monday – Friday from 8 a.m. to 8 p.m. ET at 866-606-8220.
- Grants.gov - contact the [Grants.gov Customer Support Hotline](#), 24 hours a day, 7 days a week, except on federal holidays, at 800-518-4726, 606-545-5035, or support@grants.gov.
- JustGrants - contact the JustGrants Service Desk at JustGrants.Support@usdoj.gov or 833-872-5175, Monday – Friday from 7 a.m. to 9 p.m. ET and Saturday, Sunday, and Federal holidays from 9 a.m. to 5 p.m. ET.

If an applicant has technical issues with SAM.gov or Grants.gov, the applicant must contact the OJP Response Center at grants@ncjrs.gov within **24 hours of the Grants.gov deadline** to request approval to submit after the deadline.

If an applicant has technical issues with JustGrants that prevent application submission by the deadline, the applicant must contact the OJP Response Center at grants@ncjrs.gov within **24 hours of the JustGrants deadline** to request approval to submit after the deadline.

Waiver requests sent to the OJP Response Center must -

- describe the technical difficulties experienced,
- include a timeline of the applicant's submission efforts (e.g., date and time the

- error occurred, date and time of actions taken to resolve the issue and resubmit; and date and time support representatives responded),
- include an attachment of the complete grant application and all the required documentation and materials,
- include the applicant's Unique Entity Identifier (UEI), and
- include any SAM.gov, Grants.gov, and JustGrants Service Desk tracking numbers documenting the technical issue.

OJP will review each waiver request and the required supporting documentation and notify the applicant whether the request for late submission has been approved or denied. An applicant that does not provide documentation of a technical issue or that does not submit a waiver request within the required time period will be denied.

For more details on the waiver process, OJP encourages applicants to review the “Experiencing Unforeseen Technical Issues” section in the [OJP Grant Application Resource Guide](#).

Application Review Information

Review Process

OJP reviews the application to make sure that the information presented is reasonable, understandable, measurable, achievable, and consistent with the solicitation. See the [OJP Grant Application Resource Guide](#) for information on the application review process for this solicitation.

Pursuant to the Part 200 Uniform Requirements, before award decisions are made, OJP also reviews information related to the degree of risk posed by the applicant entity. Among other things to help assess whether an applicant with one or more prior federal awards has a satisfactory record with respect to performance, integrity, and business ethics, OJP checks whether the applicant entity is listed in SAM as excluded from receiving a federal award.

In addition, if OJP anticipates that an award will exceed \$250,000 in federal funds, OJP also must review and consider any information about the applicant that appears in the non-public segment of the integrity and performance system accessible through SAM (currently, the Federal Awardee Performance and Integrity Information System, FAPIIS).

Important note on FAPIIS: An applicant may review and comment on any information about its organization that currently appears in FAPIIS and was entered by a federal awarding agency. OJP will consider such comments by the applicant, in addition to the other information in FAPIIS, in its assessment of the risk posed by the applicant entity.

Absent explicit statutory authorization or written delegation of authority to the contrary, all final award decisions will be made by the Assistant Attorney General, who may consider not only peer review ratings and BJA recommendations, but also other factors as indicated in this section.

Federal Award Administration Information

Federal Award Notices

Generally, award notifications are made by the end of the current Federal fiscal year, September 30th. See the [OJP Grant Application Resource Guide](#) for information on award notifications and instructions.

Administrative, National Policy, and Other Legal Requirements

If selected for funding, in addition to implementing the funded project consistent with the OJP-approved application, the recipient must comply with all award conditions and all applicable requirements of federal statutes and regulations, including the applicable requirements referred to in the assurances and certifications executed in connection with award acceptance. For additional information on these legal requirements, see the “Administrative, National Policy, and Other Legal Requirements” section in the [OJP Grant Application Resource Guide](#).

Information Technology (IT) Security Clauses

An application in response to this solicitation may require inclusion of information related to information technology security. See the [OJP Grant Application Resource Guide](#) for information.

General Information about Post-Federal Award Reporting Requirements

In addition to the deliverables described in the “Program Description” section, all award recipients under this solicitation will be required to submit certain reports and data.

Required reports - Award recipients typically must submit quarterly financial reports, quarterly performance measurement reports, semi-annual performance reports, final financial and performance reports, and, if applicable, an annual audit report in accordance with the Part 200 Uniform Requirements or specific award conditions. Future awards and fund drawdowns may be withheld if reports are delinquent. (In appropriate cases, OJP may require additional reports.)

Specific reporting requirements by category are listed below:

Category 1 — Eligible Allocation Amounts of Less than \$25,000

Recipients must submit:

- Quarterly Federal Financial Reports (and one final Federal Financial Report after all funds have been obligated and expended) through OJP's JustGrants system.
- Quarterly Performance Measurement Tool reports and a final Performance Measurement Tool report through BJA's PMT. Please note that as soon as all project activity has concluded, that report may be marked final.
- An annual performance report and final progress report through OJP's JustGrants. If all project activity has concluded at the time the first annual performance report is submitted, that report may be marked final.
- If applicable, an annual audit report in accordance with the Part 200 Uniform Requirements or specific award conditions.

Category 2 — Eligible Allocation Amounts of \$25,000 or More

Recipients must submit:

- Quarterly Federal Financial Reports (and one final Federal Financial Report after all funds have been obligated and expended) through OJP's JustGrants system.
- Quarterly Performance Measurement Tool reports and a final Performance Measurement Tool report (at any time once all project activity has concluded) through BJA's PMT.
- Semi-annual performance reports and a final performance report (at any time once all project activity has concluded) through OJP's JustGrants.
- If applicable, an annual audit report in accordance with the Part 200 Uniform Requirements or specific award conditions.

See the [OJP Grant Application Resource Guide](#) for additional information on specific post-award reporting requirements, including performance measure data.

Federal Awarding Agency Contact(s)

For OJP contact(s), and contact information for Grants.gov and JustGrants, see the solicitation cover page.

Other Information

Freedom of Information and Privacy Act (5 U.S.C. 552 and 5 U.S.C. 552a)

See the [OJP Grant Application Resource Guide](#) for information on the Freedom of Information and Privacy Act (5 U.S.C. §§ 552 and 5 U.S.C. 552a).

Provide Feedback to OJP

See the [OJP Grant Application Resource Guide](#) for information on how to provide feedback to OJP.

Application Checklist

BJA FY 23 Edward Byrne Memorial Justice Assistance Grant Formula Program - Local Solicitation

This application checklist has been created as an aid in developing an application. For more information, reference the [OJP Application Submission Steps in the OJP Grant Application Resource Guide](#) and the [DOJ Application Submission Checklist](#).

Pre-Application

Before Registering in Grants.gov:

- Acquire or renew your Entity's [System Award Management \(SAM\) Registration Information](#) (see [OJP Grant Application Resource Guide](#))

Register in Grants.gov

- Acquire an Authorized Organization Representative (AOR) and a Grants.gov username and password (see [OJP Grant Application Resource Guide](#))
- Acquire AOR confirmation from the E-Business Point of Contact (E-Biz POC) (see [OJP Grant Application Resource Guide](#))

Find the Funding Opportunity

- Search for the funding opportunity in Grants.gov using the opportunity number, assistance listing number, or keyword(s)
- Select the correct Competition ID
- Access the funding opportunity and application package (see Step 7 in the [OJP Grant Application Resource Guide](#))
- Sign up for Grants.gov email [notifications](#) (optional) (see [OJP Grant Application Resource Guide](#))
- Read [Important Notice: Applying for Grants in Grants.gov](#)
- Read OJP policy and guidance on conference approval, planning, and reporting available at <https://www.ojp.gov/funding/financialguidedo/iii-postaward-requirements#6g3y8> (see [OJP Grant Application Resource Guide](#))

Review the Overview of Post-Award Legal Requirements

- Review the "[Overview of Legal Requirements Generally Applicable to OJP Grants and Cooperative Agreements - FY 2023 Awards](#)" in the [OJP Funding Resource Center](#).

Review the Scope Requirement

- The federal amount requested is within the allowable limit. See <https://bjaojp.gov/program/jag/fy-2023-allocations>.

Review Eligibility Requirement: Review the Eligibility section on the cover page and

Eligibility Information section in the solicitation.

Application Step 1

Submit the **SF-424** and **SF-LLL** in Grants.gov

- In Section 8F of the SF-424, include the name and contact information of the individual **who will complete the application in JustGrants and the SF-LLL in Grants.gov**
- Submit Intergovernmental Review (if applicable)

Within 48 hours after the SF-424 and SF-LLL submission in Grants.gov, receive four (4) Grants.gov email notifications:

- a submission receipt
- a validation receipt
- a grantor agency retrieval receipt
- an agency tracking number assignment

If no Grants.gov receipt and validation email is received, or if error notifications are received:

- Contact BJA or Grants.gov Customer Support Hotline at 800-518-4726, 606-545-5035, [Grants.gov customer support](#), or support@grants.gov regarding technical difficulties (see [OJP Grant Application Resource Guide](#))

Within 24 hours after receipt of confirmation emails from Grants.gov, the individual in Section 8F of the SF-424 will receive an email from JustGrants with login instructions.

- Proceed to Application Step 2 and complete application in JustGrants

Application Step 2

Submit the following information in JustGrants

Application Components

- Standard Applicant information (SF-424 information from Grants.gov)
- Proposal Abstract
- Proposal Narrative

Budget and Associated Documentation

- Budget Worksheet and Narrative (attachment)
- Indirect Cost Rate Agreement (if applicable) (see [OJP Grant Application Resource Guide](#))
- Financial Management and System of Internal Controls Questionnaire (see [OJP Grant Application Resource Guide](#))

Additional Application Components

- Research and Evaluation Independence and Integrity (see [OJP Grant Application](#)

- [Resource Guide](#))
- Memorandum of Understanding (if applicable)
- [FY23 JAG - Certifications and Assurances by the Chief Executive of the Applicant Government](#)

Disclosures and Assurances

- [Disclosure of Lobbying Activities \(SF-LLL\)](#) (see [OJP Grant Application Resource Guide](#))
- Applicant Disclosure of Duplication in Cost Items (see [OJP Grant Application Resource Guide](#))
- DOJ Certified Standard Assurances (see [OJP Grant Application Resource Guide](#))
- DOJ Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; Drug-Free Workplace Requirements; Law Enforcement and Community Policing (see [OJP Grant Application Resource Guide](#))
- Applicant Disclosure and Justification – DOJ High Risk Grantees (if applicable) (see [OJP Grant Application Resource Guide](#))

Review, Certify and Submit Application in JustGrants

- Any validation errors will immediately display on screen after submission.
- Correct validation errors, if necessary, and then return to the “Certify and Submit” screen to submit the application. Access the [Application Submission Validation Errors Quick Reference Guide](#) for step-by-step instructions to resolve errors prior to submission.
- Once the application is submitted and validated, a confirmation message will appear at the top of the page. Users will also receive a notification in the “bell” alerts confirming submission.

If no JustGrants application submission confirmation email or validation is received, or if error notification is received:

- Contact the JustGrants Service Desk at 833-872-5175 or JustGrants.Support@usdoj.gov regarding technical difficulties. See the [OJP Grant Application Resource Guide](#) for additional information.

Standard Solicitation Resources

[OJP Grant Application Resource Guide](#) provides guidance to assist OJP grant applicants in preparing and submitting applications for OJP funding.

[DOJ Grants Financial Guide](#) serves as the primary reference manual to assist award recipients in fulfilling their fiduciary responsibility to safeguard grant funds and to ensure funds are used for the purposes for which they were awarded. It compiles a variety of laws, rules and regulations that affect the financial and administrative management of DOJ awards. This guide serves as a starting point for all award recipients and subrecipients of DOJ grants and cooperative agreements in ensuring the effective day-to-day management of awards.

[JustGrants Resources Website](#) is an entryway into information about JustGrants and the grants management system itself. Through this portal both award recipients and applicants can access training resource and user support options, find frequently asked questions and sign-up for the [JustGrants Update e-newsletter](#).

[JustGrants Application Submission Training Page](#) offers helpful information and resources on the application process. This training page includes e-learning videos, reference guides, checklists and other resources to help applicants complete an application.

[Virtual Q&A Sessions](#) are advertised here and provide opportunities for users to receive topic-specific training, direct technical assistance, and support on JustGrants system functionality.

STAFF REPORT

Meeting Date: May 21, 2024
Item #: 3

Contact Name: Martrivus Keaton
Contact Number: Ext. 1088

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Approval of a Two-Year Warranty Surety and Maintenance, Materials, and Workmanship Agreement for Commerce 429. (Development Engineer Keaton)

Background Summary:

Commerce 429 Phase 1 is located at 1040 Ocoee Apopka Road, Parcel I.D. 07-22-29-0000-00-026. The property consists of 6 light industrial warehouses, (3) 27,786 square foot buildings, (2) 49,956 square foot buildings, and (1) 131,156 square foot building. The infrastructure improvements include public roadways, a force main, potable water, sanitary sewer, other private utilities, stormwater collection system, and associated landscaping. Identified punch list repairs are currently being completed, and the developer is nearly ready to start the two-year warranty period for the public improvements.

As a requirement of the Land Development Code, the developer is required to furnish the City with a Surety to cover any possible damages discovered during the next two years. Should the developer not choose to make those repairs, Progress Commerce Park, LLC, Inc., has provided the City with an Escrow in the amount of 10% of the constructed improvements cost of \$270,442.54. The Escrow provided is for a total of \$27,044.25. The attached Maintenance, Materials, and Workmanship Agreement (Form 8 from the Land Development Code) act as the executable document between the developer and the City. The Surety will be returned to the developer upon completion of the two-year warranty period and the repair of any damages caused over those two years.

Issue:

Should the Honorable Mayor and City Commissioners approve the City to accept the Surety as provided by Progress Commerce Park, LLC, for the two-year warranty for Commerce 429 Phase 1, and execute the Maintenance, Materials, and Workmanship Agreement?

Recommendations:

The Development Services Department recommends the Honorable Mayor and Commissioners approve the Surety and the execution of the Maintenance, Materials, and Workmanship Agreement with Progress Commerce Park, LLC, for Commerce 429 Phase 1.

Attachments:

1. MMW Agreement - 2 year

Financial Impacts:

There are no financial impacts to the City in accepting this two-year warranty Surety.

Type of Item: Consent

MAINTENANCE, MATERIALS, AND WORKMANSHIP
ESCROW AGREEMENT

This Agreement is entered into this ____ day of May, 2024, by **Progress Commerce Park, LLC**, hereinafter referred to as "Developer" and the **City of Ocoee, a Florida municipal corporation**, hereinafter referred to as the "City".

WHEREAS, Developer is the owner of certain real property located in Orange County, Florida more fully described in the attached **Exhibit "A"** which exhibit is incorporated herein by this reference (the "Property"); and

WHEREAS, Developer has developed and constructed on the property, a subdivision known as Commerce 429 (the "Subdivision") and in connection therewith has installed with the approval of the City certain roads, streets, sewers, water systems, drainage works, and/or other improvements (the "Improvements") under the provisions, conditions, and requirements of the City's Subdivision Regulations and the subdivision approval granted the 8th day of August, 2024 by the Board of City Commissioners; and

WHEREAS, under Section 4-4, Subdivision Review Process, of the City's Land Development Code, Developer is required to warrant the maintenance, materials, and workmanship of the Improvements constructed by Developer within the Subdivision; and

WHEREAS, Section 4-4, Subdivision Review Process, of the City's Land Development Code provide that Developer may guaranty such maintenance, materials, and workmanship by placing a cash escrow with the City; and

WHEREAS, Developer wishes to establish an escrow fund in order to guaranty the maintenance, materials, and workmanship of the Improvements within the Subdivision as required by Section 4-4, Subdivision Review Process, of the Land Development Code.

NOW THEREFORE, the parties agree as follows:

SECTION 1. ESTABLISHMENT OF ESCROW FUND.

Developer does hereby establish an escrow fund with the City in the amount of \$27,044.25 to guaranty the maintenance, materials, workmanship, and structural integrity of the Improvements.

This escrow fund shall be placed by the City in an account at a local financial institution and shall be disbursed only in accord with the terms of this Agreement.

SECTION 2. TERMS AND CONDITIONS FOR RETURN OF ESCROW FUND.

In the event Developer shall maintain the Improvements in a first class condition for a period of two (2) years from the date of issuance of the Certificate of Completion for the Improvements, and if Developer shall replace all paving or other structures which within said two (2) year period shall be found by the City not to comply with said subdivision approval, and that if the Developer shall replace any other Improvements the materials, workmanship, or structural integrity of which shall be found by the City not to comply with said subdivision approval for a two (2) year period following issuance of the Certificate of Completion by the City, and shall pay any and all costs or expenses incidental to the performance of any work required to be performed hereunder, then the monies escrowed hereunder less an administrative fee of two (2) percent which shall be retained by the City and less all bank charges with respect to the maintenance of the escrow fund shall be returned to the Developer within 15 days from the end of the aforementioned two (2) year period.

SECTION 3. CITY'S RIGHT TO DRAW ON ESCROW FUND.

The funds escrowed hereunder shall be used by the City only to repair or replace the Improvements deemed by the City to not comply with the subdivision approval except as mutually agreed to by the parties. If at any time during the two (2) year period following the issuance of the Certificate of Completion for the Improvements the City notifies Developer in writing of any deficiency or fault in the materials, workmanship, or structural integrity of the Improvements, and Developer fails to correct such deficiency or fault to the satisfaction of the City within thirty (30) days of such written notice, then the City may make such corrections, the cost of which shall be paid for out of the escrow fund for this purpose without further notice to Developer.

Notwithstanding anything contained in Section 2 above, in the event the City has notified Developer of a deficiency or fault as provided above, the term of this Agreement shall continue until such deficiency or fault is corrected.

SECTION 4. AMENDMENT OF ESCROW FUND.

In the event that the Developer's private force main is dedicated to the City within the two (2) year warranty period, the Developer agrees to amend this Agreement to increase the amount in the escrow fund to include the cost of all material, labor, equipment and restoration required to maintain the force main for the duration of the two (2) year warranty period referenced herein.

SECTION 5. CONTINUED APPLICABILITY OF SUBDIVISION REGULATIONS.

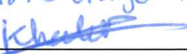
This Agreement shall not be construed to relieve or release Developer from any of its obligations under the City Subdivision Regulations with respect to the Improvements.

SIGNATURES TO FOLLOW

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed as of the date and year first above written.

Signed, sealed and delivered
in the presence of:



Print Name Pierce Haggard
189 S Orange Ave, Ste 1170, Orlando FL 32801


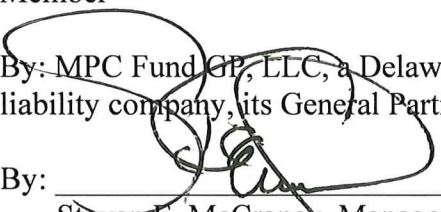
Print Name Khalid AlBudeiri
189 S Orange Ave, Ste 1170,
Orlando FL 32801

DEVELOPER:

PROGRESS COMMERCE PARK, LLC, a
Florida limited liability company

By: McCraney Industrial Real Estate Fund,
L.P., a Delaware limited partnership, its Sole
Member

By: MPC Fund GP, LLC, a Delaware limited
liability company, its General Partner


By: _____
Steven E. McCraney, Manager
189 S Orange Ave Ste 1170
Orlando, Florida 32801

ATTEST:

By: _____
City Clerk

(SEAL)

FOR THE USE AND RELIANCE BY THE
CITY OF OCOEE ONLY. APPROVED
AS TO FORM AND LEGALITY
this _____ day of
_____, 20__.

FISHBACK DOMINICK

By: _____
City Attorney

CITY:

CITY OF OCOEE, FLORIDA,
a Florida municipal corporation

By: _____
Mayor

APPROVED BY THE OCOEE CITY
COMMISSION AT A MEETING
HELD ON _____, 20__
UNDER AGENDA ITEM NO. _____.

EXHIBIT "A"

(Legal Description of Real Property Constituting the Subdivision)

PARCEL 1:

THE WEST 2 ACRES OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, LESS THE SOUTH 75 FEET OF THE NORTH 150 FEET OF THE WEST 100 FEET THEREOF, ORANGE COUNTY, FLORIDA.

AND

THE SOUTH 75 FEET OF THE NORTH 150 FEET OF THE WEST 100 FEET OF THE WEST 2 ACRES OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, ORANGE COUNTY, FLORIDA.

AND

The Southeast quarter (1/4) of the Northwest quarter (1/4) of the of the Northeast quarter (1/4) of the Southwest quarter (1/4) of Section 7, Township 22 South, Range 28 East, Orange County, Florida.

PARCEL 2:

Beginning at the Southeast corner of the Southwest quarter (1/4) of the Northwest quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4) of Section 7, Township 22 South, Range 28 East, run South 88 degrees 16 minutes 00 seconds West along the South line of the said Southwest quarter (1/4) of the Northwest quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4) 31.00 feet; thence North 0 degrees 13 minutes 00 seconds West 336.42 feet to the North line of said Southwest quarter (1/4) of the Northwest quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4); thence North 88 degrees 03 minutes 00 seconds East 40.00 feet to the Northeast corner of the said Southwest quarter (1/4) of the Northwest quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4); thence South 1 degree 18 minutes 40 seconds West 336.93 feet to the Point of Beginning, Orange County, Florida;

Together with:

The North half (1/2) of the Southeast quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter of Section 7, Township 22 South, Range 28 East, Orange County, Florida; and the South half (1/2) of the Northeast quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4) and the South half (1/2) of the Southeast quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4) of Section 7, Township 22 South, Range 28 East, Orange County, Florida; and the South quarter (1/4) of the West half (1/2) of the Northeast quarter (1/4) of the Southwest quarter (1/4), Less the West 2 acres thereof, Section 7, Township 22 South, Range 28 East, Orange County, Florida;

PARCEL 3:

The North half (1/2) of the Southwest quarter (1/4) of the Northeast quarter (1/4) of the Southwest quarter (1/4) of Section 7, Township 22 South, Range 28 East, Orange County, Florida.

PARCEL 4:

A portion of that certain Parcel of land described in Official Records Book 5140, Page 1052, and that certain Parcel of land described in Official Records Book 5140, Page 1505, Public Records of Orange County, Florida, and lying in the Southwest quarter (1/4) of Section 7, Township 22 South, Range 28 East, Orange County, Florida, being more particularly described as follows:

Commence at the Northwest corner of the Southwest quarter (1/4) of Section 7, Township 22 South, Range 28 East, Orange County, Florida, said point being a 6 inch by 6 inch concrete monument; thence South 00 degrees 18 minutes 20 seconds East, along the West line of the Southwest quarter (1/4) of said Section 7 for 1321.69 feet to the North line of the Southwest quarter of the Southwest quarter (1/4) of said Section 7; thence North 87 degrees 51 minutes 01 second East along said North line for 624.53 feet to the Easterly Limited Access Right-of-Way line of the Western Beltway, State Road No. 429, Orlando-Orange County Expressway Authority Project No. 75320-6460-602/603 and the Point of Beginning; thence continue North 87 degrees 51 minutes 01 second East along said Easterly Limited Access Right-of-Way line for 10.00 feet; thence North 01 degree 43 minutes 28 seconds West along said Easterly Limited Access Right-of-Way line for 520.02 feet; thence North 87 degrees 51 minutes 02 seconds East along said Easterly Limited Access Right-of-Way line for 290.85 feet; thence North 01 degree 43 minutes 28 seconds West along said Easterly Limited Access Right-of-Way line for 1273.05 feet to the Easterly line of the aforesaid Parcel of land described in Official Records Book 5140, Page 1052; thence South 19 degrees 52 minutes 25 seconds East along said Easterly line for 21.38 feet; thence South 42 degrees 23 minutes 10 seconds East along said Easterly line for 135.00 feet; thence South 05 degrees 11 minutes 50 seconds East along said Easterly line for 203.00 feet; thence South 12 degrees 16 minutes 38 seconds East along said Easterly line for 172.00 feet; thence South 16 degrees 26 minutes 18 seconds West along said Easterly line for 137.99 feet; thence South 06 degrees 41 minutes 41 seconds East along said Easterly line for 220.00 feet; thence South 40 degrees 17 minutes 22 seconds East along said Easterly line for 395.00 feet; thence South 52 degrees 43 minutes 08 seconds East along said Easterly line for 43.00 feet; thence South 00 degrees 23 minutes 41 seconds West along said Easterly line, also being the East line of the Northwest quarter (1/4) of the Southwest quarter (1/4) of said Section 7, for 610.07 feet to the North line of the Southwest quarter (1/4) of the Southwest quarter (1/4) of said Section 7; thence South 87 degrees 51 minutes 01 second West along said North line for 626.00 feet to the East line of the aforesaid Parcel of land described in Official Records Book 5140, Page 1505; thence South 00 degrees 23 minutes 41 seconds West along said East line for 328.65 feet; thence South 87 degrees 51 minutes 01 second West along the South line of said Parcel described in Official Records Book 5140, Page 1505 for 34.27 feet to the aforesaid Easterly Limited Access Right-of-Way line of the Western Beltway; thence North 01 degree 43 minutes 28 seconds West along said Easterly Limited Access Right-of-Way line for 328.32 feet to the Point of Beginning.

STAFF REPORT

Meeting Date: May 21, 2024
Item #: 4

Contact Name: Martrivus Keaton
Contact Number: Ext. 1088

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Approval of a Two-Year Warranty Surety and Maintenance, Materials, and Workmanship Agreement for Christian Brothers Automotive. (Development Engineer Keaton)

Background Summary:

Christian Brothers Automotive is located at 1140 Maguire Road, Parcel I.D. 20-22-28-9138-03-00. The property is on a portion of lot 3 of West Colonial Ocoee and consists of a 5,000 square foot automobile services building. The infrastructure improvements include public reclaim, potable water, and other private utilities. Identified punch list repairs are currently being completed, and the developer is nearly ready to start the two-year warranty period for the public improvements.

As a requirement of the Land Development Code, the developer is required to furnish the City with a Surety to cover any possible damages discovered during the next two years. Should the developer not choose to make those repairs, Christian Brothers Automotive, Corp., has provided the City with an Escrow in the amount of 10% of the constructed improvements cost of \$32,826.00. The Escrow provided is for a total of \$3,282.60. The attached Maintenance, Materials, and Workmanship Agreement (Form 8 from the Land Development Code) act as the executable document between the developer and the City. The Surety will be returned to the developer upon completion of the two-year warranty period and the repair of any damages caused over those two years.

Issue:

Should the Honorable Mayor and City Commissioners approve the City to accept the Surety as provided by Christian Brothers Automotive, Corp, for the two-year warranty for Christian Brothers Automotive and execute the Maintenance, Materials, and Workmanship Agreement?

Recommendations:

The Development Services Department recommends the Honorable Mayor and Commissioners approve the Surety and the execution of the Maintenance, Materials, and Workmanship Agreement with Christian Brothers Automotive, Corp, for Christian Brothers Automotive.

Attachments:

1. Maintenance, Materials and Workmanship Agreement - Christian Brothers

Financial Impacts:

There are no financial impacts to the City in accepting this two-year warranty Surety.

City of Ocoee ▪ 1 N. Bluford Avenue ▪ Ocoee, Florida 34761
Phone: (407) 905-3100 ▪ www.ocoe.org

Type of Item: Consent

MAINTENANCE, MATERIALS, AND WORKMANSHIP
ESCROW AGREEMENT

This Agreement is entered into this ____ day of _____, 2024, by CBH Properties Ocoee, LLC hereinafter referred to as "Developer" and the **City of Ocoee, a Florida municipal corporation**, hereinafter referred to as the "City".

WHEREAS, Developer is the owner of certain real property located in Orange County, Florida more fully described in the attached **Exhibit "A"** which exhibit is incorporated herein by this reference (the "Property"); and

WHEREAS, Developer has developed and constructed on the property, a subdivision known as West Colonial Ocoee Commercial (the "Subdivision") and in connection therewith has installed with the approval of the City certain roads, streets, sewers, water systems, drainage works, and/or other improvements (the "Improvements") under the provisions, conditions, and requirements of the City's Subdivision Regulations and the subdivision approval granted the 20th day of July, 2021, by the Board of City Commissioners; and

WHEREAS, under Section 4-4, Subdivision Review Process, of the City's Land Development Code, Developer is required to warrant the maintenance, materials, and workmanship of the Improvements constructed by Developer within the Subdivision; and

WHEREAS, Section 4-4, Subdivision Review Process, of the City's Land Development Code provide that Developer may guaranty such maintenance, materials, and workmanship by placing a cash escrow with the City; and

WHEREAS, Developer wishes to establish an escrow fund in order to guaranty the maintenance, materials, and workmanship of the Improvements within the Subdivision as required by Section 4-4, Subdivision Review Process, of the Land Development Code.

NOW THEREFORE, the parties agree as follows:

SECTION 1. ESTABLISHMENT OF ESCROW FUND.

Developer does hereby establish an escrow fund with the City in the amount of \$3,282.60 to guaranty the maintenance, materials, workmanship, and structural integrity of the Improvements. This escrow fund shall be placed by the City in an account at a local financial institution and shall be disbursed only in accord with the terms of this Agreement.

SECTION 2. TERMS AND CONDITIONS FOR RETURN OF ESCROW FUND.

In the event Developer shall maintain the Improvements in a first class condition for a period of two (2) years from the date of issuance of the Certificate of Completion for the Improvements, and if Developer shall replace all paving or other structures which within said two (2) year period shall be found by the City not to comply with said subdivision approval, and that if the Developer shall replace any other Improvements the materials, workmanship, or structural integrity of which shall be found by the City not to comply with said subdivision approval for a two (2) year period following issuance of the Certificate of Completion by the City, and shall pay any and all costs or expenses incidental to the performance of any work required to be performed hereunder, then the monies escrowed hereunder less an administrative fee of two (2) percent which shall be retained by the City and less all bank charges with respect to the maintenance of the escrow fund shall be returned to the Developer.

SECTION 3. CITY'S RIGHT TO DRAW ON ESCROW FUND.

The funds escrowed hereunder shall be used by the City only to repair or replace the Improvements deemed by the City to not comply with the subdivision approval except as mutually agreed to by the parties. If at any time during the two (2) year period following the issuance of the Certificate of Completion for the Improvements the City notifies Developer in writing of any deficiency or fault in the materials, workmanship, or structural integrity of the Improvements, and Developer fails to correct such deficiency or fault to the satisfaction of the City within thirty (30) days of such written notice, then the City may make such corrections, the cost of which shall be paid for out of the escrow fund for this purpose without further notice to Developer.

Notwithstanding anything contained in Section 2 above, in the event the City has notified Developer of a deficiency or fault as provided above, the term of this Agreement shall continue until such deficiency or fault is corrected.

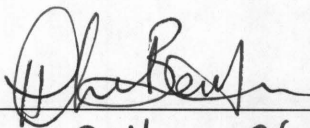
SECTION 4. CONTINUED APPLICABILITY OF SUBDIVISION REGULATIONS.

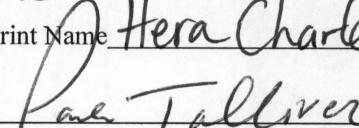
This Agreement shall not be construed to relieve or release Developer from any of its obligations under the City Subdivision Regulations with respect to the Improvements.

SIGNATURES TO FOLLOW

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed as of the date and year first above written.

Signed, and delivered
in the presence of:

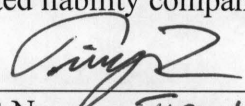


Print Name Hera Charles-Bethune


Print Name Paula Tolliver

DEVELOPER:

CBH Properties Ocoee, LLC, a Florida
limited liability company

By: 
Print Name: Timothy R. Geiger
Its: VP

ATTEST:

CITY:

CITY OF OCOEE, FLORIDA,
a Florida municipal corporation

By: _____
City Clerk

By: _____
Mayor

(SEAL)

For the use and reliance by the City of Ocoee
only. Approved as to form and legality this
__ day of _____, 20__.

Approved by the Ocoee City Commission at a
meeting held on _____, 20__
under Agenda Item No. _____.

SHUFFIELD, LOWMAN & WILSON, P.A.

By: _____
City Attorney

EXHIBIT "A"

(Legal Description of Real Property Constituting the Subdivision)

Lot 3, West Colonial Ocoee, according to the plat thereof recorded in Plat Book 93, Page 35, of the public records of Orange County, Florida.



Meeting Date: May 21, 2024
Item #: 5

Contact Name: Michael Rumer
Contact Number: Ext. 1018

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Approval of First Amendment to the 15 S. Kissimmee Street and 214 W. McKey Street Contract. (Development Services Director Rumer)

Background Summary:

On December 5, 2023, the Honorable Mayor and City Commission approved an addendum to the Contract for Sale and Purchase from 2BPLATINUM, LP for two (2) city-owned parcels identified as 15 S. Kissimmee Ave. and 214 W. McKey Street. The approved addendum provided for the following:

- 1) The City will sell the entire property minus the area for the ROW dedication.
- 2) The area of land where the proposed city stormwater pond was to be located will contain a drainage easement with a specified pond volume to handle the Kissimmee Road project.
- 3) The purchase price will be reduced by \$84,046.83. This is the amount estimated for the City to construct the pond. The new purchase price with the reduction is \$215,953.17.
- 4) City sewer service would be located to the property within eight (8) months after closing.

Following the approval of the aforesaid addendum to the contract, the Purchaser (2BPLATINUM) purchased three (3) parcels adjacent to 15 S. Kissimmee Street and 214 W. McKey St. (parcels under contract) on the south side. Upon review of the additional parcels and revised conceptual site plan, the Purchaser determined that a 4-inch force main provides the required capacity to serve the three (3) above-referenced parcels. The Purchaser also provided the location of their proposed private lift station for the sewer connection point. It is agreed upon by the "Seller" (the City) to have the Seller extend a 4-inch force main currently under construction for the Floral Sewer extension project under Floral Street and Kissimmee Ave. to the southwest corner of Floral St and S. Kissimmee Avenue right-of-way, thereby providing a sewer stub out to the property identified by Orange County Property Appraiser Parcel 10 #18-22-28-7224-02080. Therefore, the requirement to close in condition #4 above is being amended:

4. The seller will extend a 4-inch force main under Floral Street and Kissimmee Ave to the southwest corner of Floral St. and S. Kissimmee intersection right-of-way, and provide a sewer connection point to the property identified by Orange County Property Appraiser Parcel 10 #18- 22- 28-7 2 2 4- 02080. Should a larger diameter force main be required, the Purchaser shall at its sole cost design and construct a new force main and carrier pipe for the larger force main.

Also, the Purchaser agreed to the following: The Closing of this transaction will occur on or before the later of thirty (30) days following the date of this First Amendment.

Issue:

Should the Honorable Mayor and City Commissioners approve a First Amendment to the contract for sale of City-owned land with 2BPLATINUM, LP located at 15 S. Kissimmee Ave and 214 W. McKey Street?

Recommendations:

Staff recommends the Honorable Mayor and City Commissioners approve a First Amendment to the contract for sale of City-owned land located at 15 S. Kissimmee Ave and 214 W. McKey Street.

Attachments:

1. Commercial Contract First Amendment- 2BPLATINUM 5-15-24

Financial Impacts:

Sale of Land in amount of \$215,953.17

Type of Item: Consent

FIRST AMENDMENT TO COMMERCIAL CONTRACT

This First Amendment to Commercial Contract (this “First Amendment”) is made as of the ___ day of _____, 202__, by and between the City of Ocoee, Florida (the “Seller”), and 2BPLATINUM, LP (the “Buyer”). The Seller and the Buyer may be referred to in this Agreement individually as a “Party” or collectively as the “Parties.”

Background Facts:

A. The Parties entered into that certain Commercial Contract dated June 21, 2022 (the “Contract”), which provides for the purchase and sale of property described in the Contract.

B. The Parties desire to amend the Contract. The Contract, as amended by this First Amendment, will be collectively referred to as the “Contract.”

Agreement:

NOW, THEREFORE, in consideration of the mutual covenants and promises made in this Contract and for other good and valuable considerations, the Parties agree as follows:

1. Capitalized terms used but not defined in this Amendment will have the definitions set forth in the Contract.
2. Section 2 of the Contract is revised to reduce the Purchase Price to \$215,953.17.
3. Section 2 of Addendum A to Commercial Contract-Additional Terms is hereby revised as follows:
 - a. Seller will no longer retain the Retention Pond which will be conveyed to Buyer. Seller will retain a portion of the Property to be utilized for right-of-way for Kissimmee Avenue as more particularly described on Exhibit “A” attached to and incorporated into this First Amendment (the “ROW Parcel”). All references to Seller Retained Land will now refer to the ROW Parcel. Seller will no longer provide the Seller’s Survey as set forth in Section 2 of the Addendum.
 - b. Buyer, at Buyer’s sole cost and expense, shall design and construct the Retention Pond. The Retention Pond will be designed to accept stormwater from the City’s right-of-way. All plans and specifications for the Retention Pond will be subject to the approval of Seller.
 - c. At Closing, Buyer shall grant Seller a drainage easement (the “Drainage Easement”) which will grant Seller the permanent right to drain into the Retention Pond as designed. The Drainage Easement will be prepared by Seller’s counsel and will be subject to the reasonable approval of Buyer. It will include provisions that require Buyer to construct the Retention Pond and grant Seller remedies in the event Buyer fails to construct the Retention Pond, including, without limitation, the ability to construct a temporary pond if Buyer has not constructed the Retention Pond when drainage is needed by City for its right-of-way construction.

- d. Seller will extend a 4-inch force main under Floral Street and Kissimmee Ave and provide a sewer stub out to the property identified by Orange County Property Appraiser Parcel ID#18-22-28-7224-02080.

4. Section 3 of Addendum A to Commercial Contract-Additional Terms is hereby deleted and replaced with the following:

Closing. The Closing of this transaction will occur on or before the later of thirty (30) days following the date of this First Amendment.

5. Section 5(e) of Addendum A is hereby deleted and replaced with the following:

e. Repurchase Right. In the event Buyer does not obtain and pay for all site and building permits necessary to contract Buyer's mixed use project on or before eighteen (18) months following Closing, subject to events of force majeure (the "Outside Completion Date"), Seller shall have the right to re-purchase the Property (including any and all improvements located thereon). The purchase price for the reconveyance shall be equal to the Purchase Price under the Agreement. The Seller will have the continuing right to re-purchase the Property by delivering written notice to Buyer until such time as all permits have been obtained. Upon delivery of a repurchase notice, the closing on the reconveyance shall be on or before sixty (60) days following Seller's election notice. Buyer shall be responsible for all closing costs relating to the reconveyance, other than Seller's attorney fees, the conveyance shall be by special warranty deed and the conveyance shall be free and clear of all liens and encumbrances not applicable to the Property as of date of Closing.

The foregoing restrictions and obligations shall survive Closing, run with the land and be incorporated into the deed of conveyance of the special warranty deed from Seller to Buyer.

6. Except as modified by this Amendment, the Parties ratify the terms of the Contract. This First Amendment may be executed in any number of counterparts, each of which shall be deemed to be an original and all of which shall, together, constitute one and the same instrument. This First Amendment, signed and transmitted by facsimile or electronic mail, shall be deemed to be and shall be treated as an original document for all purposes, and shall be considered to have the same binding legal effect as an original signature on an original document. This First Amendment shall take effect upon execution and delivery by both Parties.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the Parties have caused this First Amendment to Purchase and Sale Contract to be executed in their name as of the day and year written below.

SELLER:

CITY OF OCOEE, FLORIDA

By: _____
Rusty Johnson, Mayor

Attest: _____
Melanie Sibbitt, City Clerk

(SEAL)

FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA. Approved as to
form and legality this _____ day of
_____, _____.

FISHBACK DOMINICK, LLP

By: _____
City Attorney

APPROVED BY THE OCOEE CITY
COMMISSION AT A MEETING HELD ON
_____ DAY OF _____,
_____, UNDER AGENDA ITEM NO.
_____.

BUYER:

2BPLATINUM, LP

By: _____
Print Name/Title:

EXHIBIT "A"

Sketch and Description:

THIS IS NOT A SURVEY

Legal Description:

A PORTION OF LAND LYING IN SECTION 18, TOWNSHIP 22 SOUTH, RANGE 28 EAST, ORANGE COUNTY, FLORIDA BEING DESCRIBED AS FOLLOWS:

THE EAST 28.50 FEET OF THE FOLLOWING:

PARCEL 1: BEGIN IN THE CENTER OF THE MAIN TRACK OF THE FLORIDA MIDLAND RAILROAD AT THE CENTER OF MCKEY STREET CROSSING AS SAID STREET IS SHOWN ON MAP OR PLAT OF THE TOWN OF OCOEE, FLORIDA, NOW ON RECORD IN THE OFFICE OF THE CLERK OF THE CIRCUIT COURT OF ORANGE COUNTY, FLORIDA, RUN SOUTH 130 FEET; THENCE WEST 30 FEET FOR POINT OF BEGINNING; RUN THENCE WEST 150 FEET; THENCE NORTH 25 FEET; THENCE EAST 150 FEET; THENCE SOUTH 25 FEET TO THE POINT OF BEGINNING. ALSO: BEGIN IN THE CENTER OF THE MAIN TRACK OF THE FLORIDA MIDLAND RAILROAD AT THE CENTER OF THE MCKEY STREET CROSSING AS SAID STREET IS SHOWN ON THE MAP OR PLAT OF THE TOWN OF OCOEE, FLORIDA, NOW OF RECORD IN THE OFFICE OF THE CLERK OF THE CIRCUIT COURT OF ORANGE COUNTY, FLORIDA, RUN SOUTH 130 FEET; THENCE WEST 30 FEET FOR THE POINT OF BEGINNING; RUN THENCE WEST 150 FEET; THENCE SOUTH 50 FEET; THENCE EAST 150 FEET; THENCE NORTH 50 FEET TO POINT OF BEGINNING.

PARCEL 2: BEGINNING AT THE CENTER OF THE CROSSING OF MCKEY STREET AND THE FLORIDA MIDLAND RAILROAD IN OCOEE, FLORIDA, RUNNING SOUTH ON THE CENTER OF MAIN TRACK 30 FEET; WEST 30 FEET FOR BEGINNING POINT; RUNNING THENCE WEST 150 FEET; THENCE SOUTH 75 FEET; THENCE EAST 150 FEET; THENCE NORTH 75 FEET TO PLACE OF BEGINNING. ALL SAID LOT OF LAND BEING IN THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 18, TOWNSHIP 22 SOUTH, RANGE 28 EAST, ORANGE COUNTY, FLORIDA.

CONTAINS 4,274 SQUARE FEET OR 0.10 ACRE, MORE OR LESS.

Abbreviation Legend:

(A) - ACTUAL	A - DELTA	GOVT - GOVERNMENT	PC - POINT OF CURVATURE	R28E - RANGE 28 EAST
APPROX - APPROXIMATE	(D) - DEED	IP - IRON PIPE	PCC - POINT OF COMPOUND	R - RADIUS
AVG - AVERAGE	(ED) - EDEED	IR - IRON ROD	PCV - CURVATURE	RAD - RADIAL
(BB) - BEARING BARS	(E) - EASEMENT	IR&C - IRON ROD & CAP	PCP - PERMANENT CONTROL POINT	REC - RECOVERED
BLDG - BUILDING	D/U - DRAINAGE AND UTILITY	L - ARC LENGTH	PC - PALE	REV - REVISION
BM - BENCH MARK	E - EASEMENT	LSB - LICENSED BUSINESS NUMBER	POS - PAGES	RP - RADIUS POINT
(C) - CALCULATED	ELEV - ELEVATION	(M) - MEASURED	PI - POINT OF INTERSECTION	R/W - RIGHT-OF-WAY
C - CHORD	EOP - EDGE OF PAVEMENT	N & D - NAIL AND DISK	PIB - POINT OF BEGINNING	SEC 18 - SECTION 18
CB - CHORD BEARING	EMT - EASEMENT	NR - NON-RADIAL	POC - POINT OF COMMENCEMENT	SD - SQUARE
CCR - CENTERED CORNER	FL - FLORIDA DEPARTMENT OF TRANSPORTATION	NSI - NON-SURVEYOR IDENTIFICATION	POL - POINT ON LINE	SD FT - SQUARE FEET
CCR # - RECORD NUMBER	FF - FINISH FLOOR	NT - NON-TANGENT	PRC - POINT OF REVERSE CURVATURE	TS - TANGENT BEARING
C/L - CENTERLINE	FND - FOUND	OR - OFFICIAL RECORDS BOOK	PRM - PERMANENT REFERENCE MONUMENT	T22S - TOWNSHIP 22 SOUTH
CM - CONCRETE MONUMENT	FPAL - FLORIDA POWER AND LIGHT	ORB - OFFICIAL RECORDS BOOK	PT - POINT OF TANGENCY	(TYP) - TYPICAL
CONC - CONCRETE	(G) - GRID (STATE PLANE)	(P) - PLAT	REC - FLORIDA EAST COAST RAILWAY	UE - UTILITY EASEMENT
COR - CORNER		PS - FLORIDA STATUTE		W/ - WITH

Surveyor's Notes:

- COPIES OF THIS SKETCH AND DESCRIPTION ARE NOT VALID WITHOUT THE ORIGINAL SIGNATURE AND SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
- ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.
- BEARINGS SHOWN HEREON ARE RELATIVE TO THE LINE BETWEEN THE TWO STATE PLANE CONTROL POINTS LISTED IN NOTE #6 BELOW AS BEING S 18°20'56" E.
- THE "LEGAL DESCRIPTION" HEREON WAS PREPARED BY SURVEYOR PER CLIENT REQUEST AND BASED ON THE TITLE SEARCH REPORT PREPARED BY AMERICAN GOVERNMENT SERVICES CORPORATION "ASDC SEARCH# 28282-16", EFFECTIVE DATE MARCH 24, 2019 AT 8:00 A.M.
- THIS IS NOT A BOUNDARY SURVEY. THIS SKETCH AND DESCRIPTION WAS PREPARED FROM INFORMATION FURNISHED TO THE SURVEYOR. NO FIELD SURVEY WAS PERFORMED TO DETERMINE OWNERSHIP.
- STATE PLANE INFORMATION SHOWN HEREON IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (1990) USING CONTROL POINTS FROM THE NOS DATA SHEETS PUBLISHED AT WWW.LABINS.ORG AND ARE AS FOLLOWS:
a) DESIGNATION "AK7281", = N 1523095.74 FEET, E 485497.86 FEET
b) DESIGNATION "AK7149", = N 1571170.99 FEET, E 479553.12 FEET

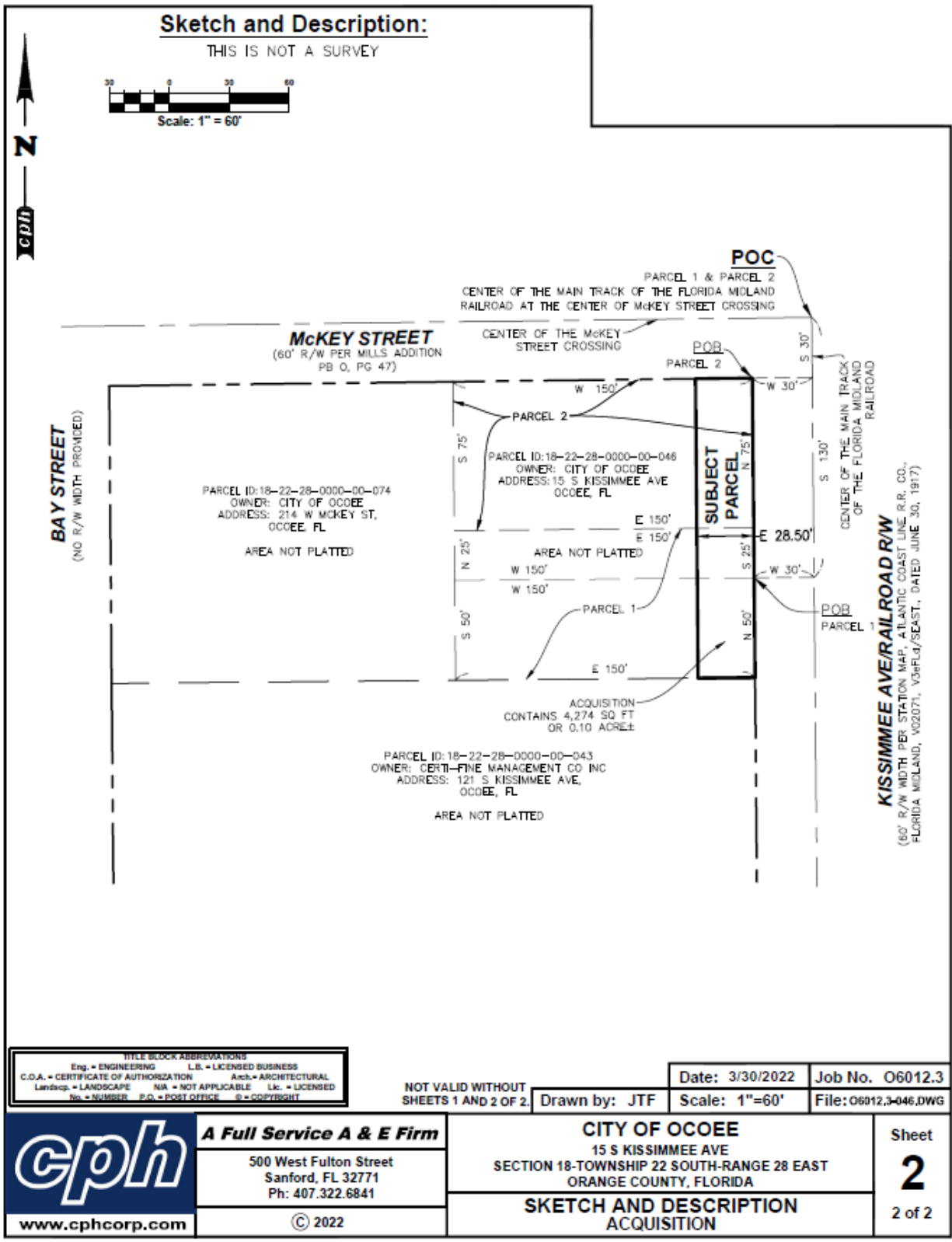
Surveyor's Certification:

I hereby certify that the attached "Sketch and Description" of the hereon-described property is true and correct to the best of my knowledge, information and belief as prepared under my direction on March 30, 2022. I further certify that this "Sketch and Description" meets the standards of practice set forth in Rule Chapter 5J-17 of the Florida Administrative Code, pursuant to FS 472.027.

For the Firm By: _____

Randall L. Roberts, PSM
Professional Surveyor and Mapper
Florida Registration No. 3144

TITLE BLOCK ABBREVIATIONS Eng. = ENGINEERING L.S. = LICENSED BUSINESS C.O.A. = CERTIFICATE OF AUTHORIZATION Arch. = ARCHITECTURAL Landsc. = LANDSCAPE NA = NOT APPLICABLE Lic. = LICENSED No. = NUMBER P.O. = POST OFFICE S. = COPYRIGHT		NOT VALID WITHOUT SHEETS 1 AND 2 OF 2.		Date: 3/30/2022	Job No. O6012.3
Drawn by: JTF		Scale: N/A		File: O6012.3-046.DWG	
		A Full Service A & E Firm 500 West Fulton Street Sanford, FL 32771 Ph: 407.322.6841 © 2022		CITY OF OCOEE 15 S KISSIMMEE AVE SECTION 18-TOWNSHIP 22 SOUTH-RANGE 28 EAST ORANGE COUNTY, FLORIDA SKETCH AND DESCRIPTION ACQUISITION	
				Sheet 1 1 of 2	



STAFF REPORT

Meeting Date: May 21, 2024
Item #: 6

Contact Name: Joyce Tolbert, Shannon Hopper Department Director: Rebecca Roberts
Contact Number: Ext. 1516, Ext. 1524 City Manager: Robert Frank

Subject: Approval of Award of ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid. (Procurement Manager Tolbert)

Background Summary: In conformance with the policies and procedures of the City of Ocoee (City) and the federal regulations of 2 CFR 200, sealed bids were solicited for ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid. This project is one of the city's designated federal grant funded ARPA projects, and generally consists of the construction of a new electrical building with electrical upgrades for the city's wastewater treatment facility.

The project was originally solicited on November 5, 2024, under ITB #24-001. A sole Bid was received in response and subsequently rejected by City Commission on February 6, 2024, as the sole Bid was \$3.325 million greater than the estimate provided by the engineer of record. In addition to rejecting the sole Bid, City Commission authorized staff to negotiate a lower price with a general contractor, which is allowable under 2 CFR 200.320(c) if competition is determined to be inadequate after solicitation. However, after the rejection, interest in the project was received, and it was determined that competition was no longer inadequate. The project was then resolicited in order to comply with federal regulations.

The rebid for this project, ITB #24-008, publicly advertised on March 9, 2024, and publicly opened on April 16, 2024. A total of four Bids were received, ranging from \$3,898,252.00 to \$5,458,700.00 as indicated in the table below. All Bids are available in the Finance Department for review. The Finance Department, Utilities Department, and the City's Owner's Representative, ZHA, reviewed the Bids. Staff recommends awarding ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid to the lowest bidder Sawcross, Inc. as the most responsive and responsible bidder, per the attached award recommendation memorandum from Jen Bolling, Assistant Utilities Director.

	BIDDER	TOTAL BASE BID
1.	Sawcross, Inc.	\$3,898,252.00
2.	Eau Gallie Electric, Inc.	\$4,656,474.00
3.	Prime Construction Group	\$4,770,759.00
4.	L7 Construction, Inc.	\$5,458,700.00

Issue:

Should the Honorable Mayor and City Commissioners award ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid to Sawcross, Inc. as recommended?

Recommendations:

Staff recommends the Honorable Mayor and City Commissioners to:

1. Award ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid to Sawcross, Inc. for the amount of \$3,898,252.00;
2. Authorize the Mayor, City Clerk, and Staff to execute the required contract documents once the required bonds and insurance are received; and
3. Authorize the City Manager to approve change orders to this contract up to the limit of his purchasing authority for each change order and up to the budgeted amount for this project for all change orders.

Attachments:

1. Award Recommendation - Utilities
2. Bid Tabulation
3. Sawcross Bid
4. Addendum 01
5. ITB #24-008 Project Manual
6. Plan Sheets

Financial Impacts:

The construction of the project was budgeted for Fiscal Year 2023-2024 for a total amount of \$2,400,000; however, the construction cost plus contingency totals \$4,677,903. The funding to cover the additional cost will come from re-allocated ARPA funds and the Utilities Fund Balance.

Type of Item: Consent

Mayor
Rusty Johnson

City Manager
Robert Frank



Commissioners
Scott R. Kennedy, District 1
Rosemary Wilsen, District 2
Richard Firstner, District 3
George Oliver III, District 4

MEMORANDUM

TO: Shannon Hopper
Purchasing Technician

Through: Jamie Croteau
Utilities Director

FROM: Jennifer Bolling, P.E.
Assistant Utilities Director

DATE: Tuesday, May 14, 2024

RE: ITB #24-008 Ocoee WWTF Electrical Upgrade & Expansion - Rebid
Project Award Recommendation

The construction of the Ocoee WWTF Electrical Upgrade & Expansion – Rebid a Federal Grant Funded ARPA project has been budgeted for Fiscal Year 2023-2024 for a total amount of \$2,400,000. The construction cost plus contingency for this project totals \$4,677,903.

This project is critical as the WWTF's existing electrical system is undersized and the equipment is nearing the end of its useful life; therefore, the funding to cover the additional cost will come from re-allocated ARPA funds and the Utilities Fund Balance. The total project cost of \$5.6 million includes construction with a 20% contingency, ZHA (owner's representative), and the direct purchase of the generator, two blowers, and a secondary power feed to the plant. The Utilities Department recommends awarding ITB #24-008 Ocoee WWTF Electrical Upgrade & Expansion - Federal Grant Funded ARPA Project to the lowest responsive bidder for the base bid, Sawcross, Inc, for \$3,898,252 based on the following:

On April 16, 2024, bids were opened for Bid ITB #24-008 Ocoee WWTF Electrical Upgrade & Expansion - Federal Grant Funded ARPA Project. Bid prices for the four (4) bidders who responded are listed below.

1. Sawcross, Inc.
10970 New Berlin Road
Base Bid Price: \$3,898,252.00

2. Eau Gallie Electric, Inc.
2012 Aurora Road
Melbourne, Florida 32935
Base Bid Price: \$4,656,474.00

City of Ocoee Utilities ▪ 1800 A.D. Mims Road ▪ Ocoee, Florida 34761
Phone: (407) 905-3159 ▪ www.occoee.org/utilities

3. Prime Construction Group
1000 Jetstream Drive
Orlando, Florida 32824
Base Bid Price: \$4,770,759.00
4. L7 Construction, Inc.
275 Hunt Park Cove
Longwood, Florida 32750
Base Bid Price: \$5,458,700.00

ITB #24-008
OCOEE WWTF ELECTRICAL UPGRADE AND EXPANSION - REBID
BID TABULATION
4/16/2024 2:00 P.M.

	BID TABULATION		Eau Gallie Electric, Inc.		L7 Construction, Inc.		Prime Construction Group, Inc.		Sawcross, Inc.	
	Acknowledged Addenda #1		✓		✓		✓		✓	
	Bid Security in the amount of 5% of Bid		Bid Bond		Bid Bond		Bid Bond		Bid Bond	
	Company/license Verification		Active				Active		Active	
	Verified No Debarment or Suspension in SAM.gov		✓				✓		✓	
	Required Forms		✓				✓		✓	
ITEM NO	ITEM DESCRIPTION	QTY	UNIT PRICE	TOTAL PRICE	UNIT PRICE	TOTAL PRICE	UNIT PRICE	TOTAL PRICE	UNIT PRICE	TOTAL PRICE
1.1	Mobilization / Demobilization	1	\$84,000.00	\$84,000.00	\$60,000.00	\$60,000.00	\$225,000.00	\$225,000.00	\$120,000.00	\$120,000.00
1.2	General Conditions	1	\$70,000.00	\$70,000.00	\$380,000.00	\$380,000.00	\$275,000.00	\$275,000.00	\$250,000.00	\$250,000.00
1.3	Utility Locates	1	\$14,000.00	\$14,000.00	\$2,500.00	\$2,500.00	\$10,000.00	\$10,000.00	\$15,000.00	\$15,000.00
1.4	Erosion Control	1	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
1.5	Construction Photographs and Audio Visual Recording	1	\$4,000.00	\$4,000.00	\$5,000.00	\$5,000.00	\$1,500.00	\$1,500.00	\$3,000.00	\$3,000.00
1.6	Survey (Horizontal and Vertical Controls & As-Builts)	1	\$28,000.00	\$28,000.00	\$15,000.00	\$15,000.00	\$17,500.00	\$17,500.00	\$10,000.00	\$10,000.00
2.1	Demolition	1	\$250,000.00	\$250,000.00	\$128,411.00	\$128,411.00	\$195,250.00	\$195,250.00	\$100,000.00	\$100,000.00
2.2.	Fill	250	\$60.00	\$15,000.00	\$90.00	\$22,500.00	\$40.00	\$10,000.00	\$40.00	\$10,000.00
2.3	Grading	1	\$45,000.00	\$45,000.00	\$15,000.00	\$15,000.00	\$19,500.00	\$19,500.00	\$15,000.00	\$15,000.00
2.4	Concrete Sidewalk and Pads	75	\$650.00	\$48,750.00	\$1,000.00	\$75,000.00	\$775.00	\$58,125.00	\$1,500.00	\$112,500.00
2.5	Sod	500	\$48.00	\$24,000.00	\$10.00	\$5,000.00	\$8.00	\$4,000.00	\$5.00	\$2,500.00
2.6	Concrete Parking	35	\$650.00	\$22,750.00	\$1,200.00	\$42,000.00	\$985.00	\$34,475.00	\$1,500.00	\$52,500.00
2.7	Bollards	13	\$1,200.00	\$15,600.00	\$1,000.00	\$13,000.00	\$600.00	\$7,800.00	\$250.00	\$3,250.00
2.8	Install (2) Blowers (Blowers Purchased by City of Ocoee)	1	\$41,000.00	\$41,000.00	\$65,000.00	\$65,000.00	\$95,000.00	\$95,000.00	\$30,000.00	\$30,000.00
3.1	Electrical Building	1	\$413,000.00	\$413,000.00	\$300,000.00	\$300,000.00	\$1,531,407.00	\$1,531,407.00	\$430,000.00	\$430,000.00
3.2	Electrical Building HVAC	1	\$86,000.00	\$86,000.00	\$70,000.00	\$70,000.00	\$65,000.00	\$65,000.00	\$50,000.00	\$50,000.00
4.1	Electrical Equipment (Not Including purchase only costs for 4.11, 4.12, 4.13, 4.14, 4.15) and including installation costs for 4.1, 4.11,4.12,4.13,4.14, 4.15	1	\$2,111,000.00	\$2,111,000.00	\$3,216,517.00	\$3,216,517.00	\$1,123,000.00	\$1,123,000.00	\$1,060,000.00	\$1,060,000.00
4.11	Equipment Purchase Only: Motor Control Centers (Spec Section 16921)	1	\$209,196.00	\$209,196.00	\$173,390.00	\$173,390.00	\$192,000.00	\$192,000.00	\$270,000.00	\$270,000.00
4.12	Equipment Purchase Only: Switchboard (Spec Section 16940)	1	\$352,872.00	\$352,872.00	\$218,937.00	\$218,937.00	\$243,200.00	\$243,200.00	\$450,000.00	\$450,000.00
4.13	Equipment Purchase Only: ATS (Spec Section 16250)	1	\$13,680.00	\$13,680.00	\$9,633.00	\$9,633.00	\$15,000.00	\$15,000.00	\$170,000.00	\$170,000.00
4.14	Equipment Purchase Only: Panelboards (Spec Section 16160)	1	\$7,605.00	\$7,605.00	\$9,572.00	\$9,572.00	\$14,500.00	\$14,500.00	\$10,000.00	\$10,000.00
4.15	Equipment Purchase Only: MB1 & MB2 (Elect Drawing)	1	\$129,519.00	\$129,519.00	\$100,738.00	\$100,738.00	\$112,000.00	\$112,000.00	\$163,000.00	\$163,000.00
4.2	Furnish and Integrate SCADA	1	\$486,502.00	\$486,502.00	\$486,502.00	\$486,502.00	\$486,502.00	\$486,502.00	\$486,502.00	\$486,502.00
4.3	Install 1000 kW Generator (Generator purchased by City of Ocoee)	1	\$180,000.00	\$180,000.00	\$40,000.00	\$40,000.00	\$25,000.00	\$25,000.00	\$75,000.00	\$75,000.00
	TOTAL BASE BID =			\$4,656,474.00		\$5,458,700.00		\$4,770,759.00		\$3,898,252.00

2

4

3

1

Bidders listed in alphabetical order.

Yellow highlights are discrepancies on the Bid Form.

License check, submitted forms, and references verified only on the three lowest Bidders.

A No Bid notification was received by email from Dickerson Infrastructure on April 4, 2024.

SECTION 00300

BID FORM - REVISION 01

SUBMITTED: 4/16/2024
(Date)

PROJECT IDENTIFICATION: CITY OF OCOEE ITB #24-008
Ocoee WWTF Electrical Upgrade and Expansion - Rebid

NAME OF BIDDER: Sawcross, Inc.

BUSINESS ADDRESS: 10970 New Berlin Rd PHONE NO.: 904-751-7500
CITY, STATE, ZIP: Jacksonville, FL 32226

CONTRACTOR'S FEDERAL I.D. NUMBER 59-3136689

CONTRACTOR'S FLORIDA LICENSE NO.: CGC036203

THIS BID IS SUBMITTED TO: City of Ocoee, Florida (hereinafter called Owner)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to perform and furnish all Work, as specified or indicated in the Contract Documents for the Contract Price and within the Contract Times indicated in this Bid Form and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Bidding Documents, including, without limitation, those dealing with the disposition of Bid Bond. This Bid will remain open for ninety (90) calendar days after the day of Bid opening. Bidder will sign and deliver the required number of counterparts of the Amendment to the Agreement with the Bonds and other documents required by the Bidding Requirements within ten (10) days after the date of Owner's Notice of Intent to Award.
3. In submitting this Bid, Bidder makes all representations required by the Instructions to Bidders and the Agreement and further warrants and represents that:
 - a. Bidder has examined copies of all the Bidding Documents and of the following Addenda:

No. <u>1</u>	Dated <u>4/3/2024</u>	No. <u> </u>	Dated: <u> </u>
No. <u> </u>	Dated <u> </u>	No. <u> </u>	Dated: <u> </u>
No. <u> </u>	Dated <u> </u>	No. <u> </u>	Dated: <u> </u>
No. <u> </u>	Dated <u> </u>	No. <u> </u>	Dated: <u> </u>

(Receipt of all which is hereby acknowledged) and also copies of the Invitation to Bid and the Instructions to Bidders.

- b. Bidder has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing the Work.
- c. Bidder has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface of subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions, as provided in paragraph 4.02.1 of the General Conditions. Bidder accepts the determination set forth in paragraph SC-4.02 of the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which Bidder is entitled to rely, as provided in paragraph 4.02 of the General Conditions. Bidder acknowledges that such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site.
- d. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work, or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.
- e. Bidder understands the full extent and scope of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted.
- f. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- g. Bidder has given Engineer written notice of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

- h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a farce or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
- i. Bidder hereby agrees to commence Work under this contract on the date to be specified in the Notice to Proceed and to fully complete all work of the project within the Contract Time specified in the Contract for Construction (Section 00500). Bidder further accepts the provisions of the Contract for Construction as to liquidated damages and agrees to pay as liquidated damages the amount stated in the Contract for Construction (Section 00500), for each consecutive calendar day completion of the Work is delayed.

Completion Schedule:

- 1) The Work shall be Substantially Complete within the Contract Time specified in Article 3.1 of the Contract for Construction (Section 00500).
 - 2) The Work shall be finally complete within the Contract Time specified in Article 3.1 of the Contract for Construction (Section 00500).
- 4. All bid items shall include all materials, equipment, labor, permit fees, taxes, tests, miscellaneous costs of all types, overhead, and profit for the item to be complete, in place, and ready for operation in the manner contemplated by the Contract Documents. Bidder submits the **TOTAL BID OR TOTAL BASE BID** to perform all the Work, as required by the Drawings and Specifications.
 - 5. The following documents are made a condition of this Bid:
 - a. **Bidding Documents and shall include the following:**
 - 1. Bid Forms (entire Section 00300, 00301, 00301A, 00302, 00303, 00310, 00311, 00312, 00313, and 00314)
 - 2. Bid Bond (Surety Bond or Cashier's Check) (Section 00410)
 - 3. Non-collusion Affidavit (Section 00480)
 - 4. Conflict of Interest Disclosure Form (Section 00480A)
 - 5. Certification of Non-segregated Facilities (Section 00481)
 - 6. Sworn Statement on Public Entity Crimes (Section 00482)
 - 7. Certification of Nondiscriminatory Labor Practices (Section 00483)
 - 8. Certification Regarding Scrutinized Companies' Lists (Section 00484)

(Remainder of page intentionally left blank)

Bid Form - Revision 01: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid					
Item No:	Description	Units	Contract Quantity	Unit Price (in Numbers)	Total Price (in Numbers)
1	Mobilization, Bonds, and General Conditions				
1.1	Mobilization/ Demobilization	Lump Sum	1.00	\$120,000.00	\$120,000.00
1.2	General Conditions	Lump Sum	1.00	\$250,000.00	\$250,000.00
1.3	Utility Locates	Lump Sum	1.00	\$15,000.00	\$15,000.00
1.4	Erosion Control	Lump Sum	1.00	\$10,000.00	\$10,000.00
1.5	Construction Photographs and Audio - Visual Recording	Lump Sum	1.00	\$3,000.00	\$3,000.00
1.6	Survey (Horizontal and Vertical Controls & As-Built)	Lump Sum	1.00	\$10,000.00	\$10,000.00
2	Site Work				
2.1	Demolition	Lump Sum	1.00	\$100,000.00	\$100,000.00
2.2	Fill	Cubic Yards	250.00	\$40.00	\$10,000.00
2.3	Grading	Lump Sum	1.00	\$15,000.00	\$15,000.00
2.4	Concrete Sidewalk and Pads	Cubic Yards	75.00	\$1,500.00	\$112,500.00
2.5	Sod	Square Yards	500.00	\$5.00	\$2,500.00
2.6	Concrete Parking	Cubic Yards	35.00	\$1,500.00	\$52,500.00
2.7	Bollards	Each	13.00	\$250.00	\$3,250.00
2.8	Install (2) Blowers (Blowers Purchased by City of Ocoee)	Lump Sum	1.00	\$30,000.00	\$30,000.00
3	Building				
3.1	Electrical Building	Lump Sum	1.00	\$430,000.00	\$430,000.00
3.2	Electrical Building HVAC	Lump Sum	1.00	\$50,000.00	\$50,000.00
4	Electrical System and Instrumentation Control				
4.1	Electrical Equipment (Not Including purchase only costs for 4.11, 4.12, 4.13, 4.14, 4.15) and including installation costs for 4.1, 4.11, 4.12, 4.13, 4.14, 4.15	Lump Sum	1.00	\$1,060,000.00	\$1,060,000.00
4.11	Equipment Purchase Only: Motor Control Centers (Spec Section 16921)	Lump Sum	1.00	\$270,000.00	\$270,000.00
4.12	Equipment Purchase Only: Switchboard (Spec Section 16940)	Lump Sum	1.00	\$450,000.00	\$450,000.00
4.13	Equipment Purchase Only: ATS (Spec Section 16250)	Lump Sum	1.00	\$170,000.00	\$170,000.00
4.14	Equipment Purchase Only: Panelboards (Spec Section 16160)	Lump Sum	1.00	\$10,000.00	\$10,000.00
4.15	Equipment Purchase Only: MB1 & MB2 (Elect Drawing)	Lump Sum	1.00	\$163,000.00	\$163,000.00
4.2	Furnish and Integrate SCADA (Allowance)	Lump Sum	1.00	486,502.00	486,502.00
4.3	Install 1000 kW Generator (Generator Purchased by City of Ocoee)	Lump Sum	1.00	\$75,000.00	\$75,000.00
				Total Base Bid	\$3,898,252.00
Written Total Base Bid: Three Million Eight Hundred Ninety-Eight Thousand Two Hundred Fifty-Two Dollars					

COMPANY NAME: Sawcross, Inc.

BID PREPARED BY (PRINT): Mark Hickinbotham, President

SIGNATURE: 

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

7. The Bidder acknowledges that the City specifically reserves the right to accept and make an award to a Bidder that has not submitted the lowest Bid when, in Owner's sole and absolute discretion, it determines that action to be in its best interest. The terms used in this Invitation to Bid, which are defined in the General Conditions and included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.
8. The work shall be performed under a Florida General Contractor license. Contract shall not be awarded unless proof of valid license(s) is provided.
9. It is understood that where quantities for unit price work have been presented on the Bid Form, they are approximate only and are solely for the purpose of facilitating the comparison of bids, and that the Contractor's compensation will be computed upon the basis, described in the measurement and payment clauses in the specifications contained herein.
10. **BASE BID - SCHEDULE OF MANUFACTURERS/SUPPLIERS**

If the foregoing Schedule of Bid Items is presented in a Base Bid format, the undersigned as Bidder, agrees that the Contract, if awarded, will be on the basis of the materials and equipment named in the Contract Documents, in accordance with Article 10 of the Instructions to Bidders (Section 00100). The undersigned, as Bidder, also agrees that the Total Bid reflects the equipment and material supplied by one of the manufacturers/suppliers listed in the City's Approved Materials List. If the Bidder desires to propose an alternate manufacturer/supplier, he may write in the name of such alternate in the substitution list included within this Bid Form, but he must, nevertheless, also choose an approved manufacturer/supplier. If the proposed alternate manufacturer/supplier is determined "not equivalent" by the Engineer, the Bidder must furnish equipment and/or material items by the Bidder's chosen approved manufacturer/supplier. If the Bidder fails to indicate which listed manufacturer/supplier he intends to use if an alternate is rejected, he must use the manufacturer/supplier chosen by the City. Also, if the Bidder chooses more than one approved manufacturer/supplier, he must use the first manufacturer/supplier written in the schedule of Base/Alternative Bid Manufactures/Suppliers table within this Bid Form (unless an alternate is approved).

11. **SUBSTITUTIONS AND "OR EQUAL"**

The undersigned as Bidder agrees that substitutions, or "equal," items will not be considered until after the effective date of the Agreement and will be evaluated in accordance with paragraphs 6.05.1 and 6.05.2 of the General Conditions. In addition to the reimbursement required under the General Conditions, the Contractor shall also reimburse the Owner for any engineering costs directly attributable to the change in manufacturers/suppliers caused by the acceptance of proposed alternates, such as, additional field trips for the Engineer, additional redesign costs, additional review costs, etc. Other costs directly attributable to the change in manufacturers/suppliers caused by the acceptance of proposed alternates, such as; increased electrical requirements, larger building, additional pumps or tankage, etc., shall be borne by others and not the Owner. If

Bidder intends to propose substitutions or "equal" items after the effective date of the Agreement, it is agreed that these items must be listed on the Substitution List included within this Bid Form, with a deductive amount representing 50 percent of the total savings between the named Base Bid/Alternative Bid item and the proposed item. "Base Bid/Alternative Bid" item substitutions providing to the Owner equipment or material cost savings of less than \$1,000 will not be considered. The undersigned, as Bidder, also agrees that if a substitution or "equal" item is not listed on the Substitution List included with the Bid, all of the savings between the named item and the proposed item will go to the Owner, if the Owner accepts the proposed item in accordance with paragraphs 6.05.1 and 6.05.2 of the General Conditions. The Owner may request, and the undersigned Bidder shall supply, complete information on proposed substitutions. Such information shall be the manufacturer's current published or preprinted information for the specific substitution.

12. As Bidder, I hereby certify that I am aware and understand that the City of Ocoee in its sole discretion reserves the right to waive technicalities or irregularities, to reject any or all Bids, and/or to accept that Bid which is in the best interest of the City. The award of this Bid, if made, may be based on considerations other than total cost, and may be awarded based on various considerations, including but not limited to: Bidder experience and whether the Bid, in the judgment of the City, is the most responsive to the City's needs.

(Remainder of page intentionally left blank)

SUBSTITUTION LIST Bidder offers the following substitutions and "equal" items.			
Equipment Item or Material	Spec Section	Alternative Manufacturer/Supplier (List One Only)	Deductible Amount* (Indicate Whether Lump Sum or Unit Price)
N/A	N/A	N/A	N/A
Represents 50 percent of the difference in cost in accordance with the General Conditions (Minimum Deductible Amount per Substitution Item shall be \$1,000) (Bidder may make additional copies of this page as required.)			

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

~~SOLE PROPRIETORSHIP~~

(SEAL)

(Individual's Signature)

(Individual's Name)

doing business as

Business Address:

Phone No.:

Florida License No.: _____

~~A PARTNERSHIP~~

(SEAL)

(Partnership Name)

(General Partner's Signature)

(General Partner's Name)

Business address:

Phone No.:

Florida License No.: _____

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

A CORPORATION

Sawcross, Inc.

(Corporation Name)

Florida

(State of Incorporation)

By

Mark Hickinbotham

(Name of person authorized to sign)

President

(Title)

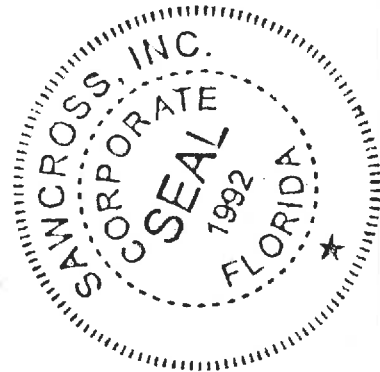
(Authorized Signature)

(Corporate Seal)

Attest

Frances Hickinbotham

(Secretary)



Business address: 10970 New Berlin Road
Jacksonville, FL 32226

Phone No.: 904-751-7500

Corporation President: Mark Hickinbotham

Florida License No.: CGC036203

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

A JOINT VENTURE

By

(Name)

(Address)

By

(Name)

(Address)

Business Address:

Phone No.:

Florida License No.:

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Florida License No.:

13. List the following in connection with the Surety which is providing the Bid Bond:

Surety's Name: Western Surety Company

Surety's Address: 151 N. Franklin St, Chicago, IL 60606

14. Name and address of Surety's resident agent for service of process in Florida:

Allyson Foss Wing

Guignard Company

1904 Boothe Circle, Longwood, FL 32750

(Remainder of page intentionally left blank.)

CORPORATE AUTHORITY TO EXECUTE DOCUMENTS

I HEREBY CERTIFY that a meeting of the Board of Directors of Sawcross, Inc., a corporation under
(Contractor's Corporate Name)
the laws of the State of Florida, held on the 8th day of April, 2024,
the following resolution was duly passed and adopted:

"RESOLVED, that Mark Hickinbotham
(signature of individual) (typed name of individual)
as President of the corporation, is hereby authorized to execute and all
documents required to be signed by an officer of the Corporation in order to submit a valid bid,
contract and bond for

CITY OF OCOEE
Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

between the CITY OF OCOEE, a municipal corporation, and this corporation, and that his
execution thereof, attested by the Secretary of the corporation and with corporate seal affixed shall
be the official act and deed of this corporation."

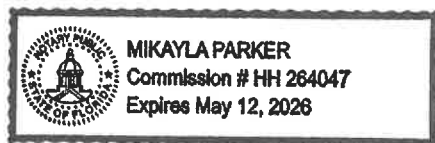
I FURTHER CERTIFY that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the
corporation this 8th day of April, 2024.
(CORPORATE SEAL)

Frances Hickinbotham (Corporate Secretary)

STATE OF Florida
COUNTY OF Duval

The foregoing instrument was acknowledged before me this 8th day of April, 2024
by _____
(name of officer or agent, title of officer or agent), by means of ☒ physical presence or ☐ online
notarization, of Sawcross, Inc. (name of corporation acknowledging), a
Florida (state or place of incorporation) corporation, on behalf of the
corporation. He/She is personally known to me or has produced _____ (type
of identification) as identification and did/did not take an oath.



(Signature)
(Notary Public)
My Commission Expires: 5/12/2026

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00300-12

**SECTION 00301
QUESTIONNAIRE**

Bidder shall fill out questionnaire form with all information pertinent to his/her company and the OCOEE WWTF Electrical Upgrade and Expansion.

DATE: 4/8/2024

PROJECT IDENTIFICATION: CITY OF OCOEE
**ITB #24-008 OCOEE WWTF ELECTRICAL UPGRADE
AND EXPANSION - REBID**

NAME OF BIDDER: Sawcross, Inc.

BUSINESS ADDRESS: 10970 New Berlin Rd, Jacksonville, FL 32226

TELEPHONE NO.: 904-751-7500 EMAIL: markh@sawcross.com

GENERAL CONTRACTOR'S LICENSE NO. (PROVIDE COPY): CGC036203

SUNBIZ REGISTRATION NUMBER: V55559

This questionnaire is intended to provide descriptive information about Bidder and to offer the opportunity for Bidder to demonstrate its compliance with the minimum requirements of this Invitation to Bid. **Minimum Requirements: Bidders must have the following experience in order to meet the minimum requirements of this Invitation to Bid: Prime Contractor on five (5) wastewater projects similar to the proposed Project and completed within the last ten (10) years, with at least three (3) of those projects being constructed in the last 5 years. Similar wastewater/water projects being either complete builds or electrical upgrades or a variation thereof.** The City reserves the right to disqualify a Bidder that does not provide this information within its Bid submission. The relevance and quality of prior experience necessary to identify a responsive Bidder shall solely be judged by the City of Ocoee at its discretion and is not reviewable through the bid protest process. Resumes of key project team members and their expected role in the project should be attached to this section and included in the Bid package submitted by the Bidder.

The undersigned warrants the truth and accuracy of all statements and answers herein contained. Include additional sheets if necessary.

1. How many years has your organization been in business?
31 years
2. REFERENCES/EXPERIENCE: List and provide information regarding the last five (5) projects you have completed in the last ten (10) years of similar in type, size, and nature as the one proposed, preferably with a governmental agency. Three of these projects must

Ocoee WWTF Electrical Upgrade and Expansion – Rebid
ITB #24-008

have been completed in the past 5 years. Bidder must demonstrate the ability to perform services of similar complexity, nature, and size. For each project list the name of the project, contract performance dates, estimated total value of the contract, name and address of government agency or commercial agency, description of work performed, Bidder's role in the project, and special conditions present that had to be overcome, Bidder's project manager, the client's project manager, a reference person familiar with your work on the project, and contact information for that person. The relevant project may be removed from the list of references if the listed contact person refuses to provide information regarding your performance. Letters of Reference may also be provided. Only contracts for which Bidder was the prime contractor will be considered to be relevant. Attach additional sheets if necessary

Minimum Requirements: Bidders must have the following experience in order to meet the minimum requirements of this Invitation to Bid: Prime Contractor on five (5) wastewater projects similar to the proposed Project and completed within the last ten (10) years, with at least three (3) of those projects being constructed in the last 5 years. Similar wastewater/water projects being either complete builds or electrical upgrades or a variation thereof.

Name of Project: Lenox Class III-IV Pump Station Replacement
Project Details: This project consisted of furnishing all labor, materials, equipment, tools, services and incidentals to construct a new 9 MGD triplex submersible pump station.
Start date: June 2018 Completion date: November 2018
Contract amount: \$4,367,000.00
Owner: Jacksonville Electric Authority
Owner's POC: Name and Title: Elizabeth DiMeo, P.E.
Phone number: 904-665-8139
Email address: dimeea@jea.com

Name of Project: Lift Station #45 Replacement
Project Details: Construction of a new pumping station with new buildings, wet well using existing structures, electrical, generator, and control equipment, pumps, bridge crane, odor control, and installation of different pipe sizes.
Start date: March 2020 Completion date: January 2022
Contract amount: \$6,981,324.49
Owner: City of Orlando
Owner's POC: Name and Title: Greg Sharp, Construction Manager
Phone number: 407-770-9375
Email address: Gregory.sharp@cityoforlando.net

Name of Project: Northeast WTP Ground Storage Tank and High Service Pump Station Upgrades
Project Details: Upgrades to the HSPS building including electrical equipment, four horizontal split case pumps, hypochlorite feed skid replacement, and HVAC system upgrades.

Start date: August 2019 Completion date: November 2020
Contract amount: \$2,992,048.00
Owner: Board of County Commisions, St. Johns County
Owner's POC: Name and Title: Teri Pinson, P.E.
Phone number: 904-209-2604
Email address: tpinson@scfl.us

Name of Project: US-1 South Re-Pump & Booster Pump Station
Project Details: Construction of a new 3,044 sqft split-face block building which included a booster pump room booster pump building including electrical room, restroom, and storage room.

Start date: August 2018 Completion date: September 2019
Contract amount: \$7,155,363.00
Owner: Jacksonville Electric Authority
Owner's POC: Name and Title: Brian Phillips, JEA Manager-Project Management
Phone number: 904-665-7625
Email address: philbr@jea.com

Name of Project: DEP SRF Harbor Road Wastewater Treatment Facility, Phase 1
Project Details: Construction of a 1.25 MG pre-stressed concrete ground storage tank, two 1,300 split-case reclaimed water high service pumps with 10,000-gallon hydropneumatics tank, and electrical and controls with backup generation.

Start date: May 2019 Completion date: May 2020
Contract amount: \$3,407,385.00
Owner: City of Green Cove Springs
Owner's POC: Name and Title: Scott Schultz, Water Utilities Director
Phone number: 904-219-7540
Email address: sschultz@greencovesprings.com

3. Do you have any similar work in progress at this time? Yes X No ____.

4. Have you ever failed to complete work awarded to you? If so, where and why?
No.

5. Name the proposed members of your project leadership team. For each person provide the name, title and years with the company. Attach the resume for all key personnel for this project.:
- Mark Hickinbotham, President (Principal-In-Charge) - 31 years
- Drew Hickinbotham, Project Manager - 6 years
- Josh Howell, Superintendent - 2 years
-
-
6. Name three (3) municipalities for which you have performed similar work and contact information:
- City of Orlando - Greg Sharp, 407-770-9375, gregory.sharp@cityoforlando.net
- City of Sanford - Richard Casella, 407-688-5095, richard.casella@sanfordsfl.gov
- City of Eustis - Rick Gierok, 352-483-5480, gierokr@ci.eustis.fl.us
7. Have you personally inspected the site of the proposed Work? Yes.
- Describe any anticipated problems with the site and your proposed solutions.
- N/A
-
8. What percentage of the Work to you intend to self-perform? 51%
9. Will you Subcontract any part of the Work? If so, describe which portions by listing the name of the subcontractor, the part of the project they are to perform, and the percentage proportion of the Work represented by that activity. Confirm that no day labor shall be used unless approved by the City. If approved by the City, day labor may only be used for tidying the site.
- Yes:
- Electrical (44%) - Carter Electric
- I & C (12%) - Telemetry & Process Controls, Inc.
-
10. What equipment do you plan on using to complete the Work?
- Backhoe, Trackhoe, Forklift, Front End Loader
-
-
-
11. State the true and exact, correct, and complete name under which you do business and give the company officer and the address of the office that will be responsible for the Work:
- Sawcross, Inc. Mark Hickinbotham, President
- 10970 New Berlin Road, Jacksonville, FL 32226

JEA - Lenox Class III-IV Pump Station Replacement

Jacksonville, Florida



This project consists of furnishing all labor, materials, equipment, tools, services and incidentals to construct a new 9 MGD triplex submersible pump station. Work included a 28' x 28' x 30' deep sheeted cofferdam including a double stage wellpoint dewatering system and a complete 23' x 23' x 20' deep poured in place concrete wetwell. The owner (JEA) provided the three 50 H.P. submersible pumps, one submersible mixer, one 200 KW standby generator and one 12" Godwin diesel driven pony pump. All the equipment was installed and started up by Sawcross. All above ground piping was welded 316 stainless steel from 8" to 20". Sitework included all clearing, excavation, grading, paving and landscaping. Coatings inside the wetwell were GML-Green Monster elastomeric coating system. The project also included all electrical work. It was a major controls project complete with three VFD's, field instruments and all SCADA work. This project was a fast track project with completion in 180 days. Extensive overtime and detailed project management were implemented to reach this compressed schedule and substantial completion date. Additionally the pump station was centered in a sensitive residential urban neighborhood and required a very detailed MOT plan. Noise had to be held to near zero. The project was completed without one single complaint from any of the residents.

OWNER

Jacksonville Electric Authority
21 W. Church Street
Jacksonville, FL 32202
Elizabeth DiMeo, P.E.
(904) 665-8139
dimeea@jea.com

ENGINEER

Mott MacDonald
1024 Centurion Parkway
Jacksonville, FL 32256
Leslie Samel, P.E.
(904) 249-6592
Leslie.Samel@mottmac.com

Project Type

Bid/Build

Original Contract Amount

\$2,967,000.00

Final Contract Amount

\$2,967,000.00 not including
\$1,400,000.00 of owner supplied
pumps, generator, fuel tank, diesel
driven backup pump and mixers.
Total contract amount
\$4,367,000.00.

Notice To Proceed Date

June, 2018

Contract Substantial Completion

December, 2018

Actual Substantial Completion

November, 2018



SAWCROSS, INC.

CONTRACTORS & ENGINEERS

CGC036203 EB8465

10970 New Berlin Road

Jacksonville, FL 32226

OFFICE: (904) 751-7500

FAX: (904) 751-0600

www.sawcross.com

PRECONSTRUCTION SERVICES

DESIGN BUILD

BID BUILD

City of Orlando - Lift Station #45 Replacement

Orlando, Florida



The work consists of construction of a new pumping station with new buildings, wet well using existing structures, electrical, generator, and control equipment, pumps, bridge crane, odor control, installation of different pipe sizes and depth for gravity sanitary sewer and force-main, bypass pumping, manholes, roadway improvements, and related work as described in plans and specifications. The Work shall be performed at the Orlando Lift Station No. 45 located at 900 Fairvilla Road in Orlando, Florida. The principal features of the Work to be performed under this Contract include construction, including but not limited to, the following: Construction of a new submersible pump type lift station, associated equipment, process and site piping, site work, concrete, miscellaneous metals, HVAC, instrumentation, electrical components, controls, and appurtenances. Connection to the existing force main. Demolition of the existing above ground lift station, associated equipment, piping, electrical components, controls, and appurtenances. Furnish, install and maintain a bypass pumping system complete and operational for the duration of the project. Clean and dispose of the liquid and solids within the existing lift station wet wells. Ground densification of the subgrade below the new Electrical Building.

OWNER

City of Orlando
Procurement and Contracts
Division
400 South Orange Avenue
Orlando, FL 32801
Greg Sharp
(407) 770-9375
Gregory.sharp@cityoforlando.net

ENGINEER

Wright-Pierce
601 S. Lake Destiny Drive
Suite 290
Maitland, FL 32751
(407) 906-1776

Project Type

Bid/Build

Original Contract Amount

\$6,889,800.00

Final Contract Amount

\$6,981,324.49

Notice To Proceed

March, 2020

Contract Substantial Completion

January, 2022

Actual Substantial Completion

January, 2022



CGC036203 EB8465

10970 New Berlin Road
Jacksonville, FL 32226

OFFICE: (904) 751-7500

FAX: (904) 751-0600

www.sawcross.com

PRECONSTRUCTION SERVICES

DESIGN BUILD

BID BUILD

Northeast WTP Ground Storage Tank and High Service Pump Station Upgrades

Ponte Vedra, Florida



The construction of the Northeast WTP Ground Storage Tank and High Service Pump Station Upgrades project required the contractor to furnish all labor, materials, equipment, and incidentals required to access site and upgrade the high service pump station and construct and additional potable water ground storage tank. This project was funded through a State Revolving Fund Loan. The work included filling, grating, seeding, and sodding. Sedimentation and erosion control measures, concrete pads for new equipment, landscaping, fencing, and restoration of the site. Storm water drainage, storm water pond, construction of swales, yard piping, fittings, and associated valves to connect to the existing piping. Installation of one precast doghouse vault for the insertion of a flow meter, modification of existing effluent flow meter vault and sodium hypochlorite vault. Upgrades to the HSPS building including electrical equipment, four horizontal split case pumps designated as one jockey pump and three high service pumps, hypochlorite feed skid replacement, and HVAC system upgrades. One 1.0 MG prestressed concrete ground storage tank, SCADA, performance and maintenance testing during construction, and all temporary and construction power requirements to maintain the facility operation building according to St. Johns County requirements.

OWNER

Board of County Commissioners,
St. Johns County
500 San Sebastian View
St. Augustine, FL 32084
Teri Pinson, P.E.
(904) 209-2604
tpinson@scfl.us

ENGINEER

Mott MacDonald
10245 Centurion Pkwy. N, Suite 320
Jacksonville, FL 32256
Leslie Samel, P.E.
(904) 249-6592
Leslie.Samel@mottmac.com

Project Type

Bid/Build

Original Contract Amount

\$2,893,000.00

Final Contract Amount

\$2,992,048.00

Notice To Proceed

August, 2019

Contract Substantial Completion

November, 2020

Actual Substantial Completion

November, 2020



CGC036203 EB8465

10970 New Berlin Road
Jacksonville, FL 32226

OFFICE: (904) 751-7500

FAX: (904) 751-0600

www.sawcross.com

PRECONSTRUCTION SERVICES

DESIGN BUILD

BID BUILD

US-1 South Re-Pump & Booster Pump Station

Jacksonville, Florida



Project consisted of the construction of a new 3,044 square foot split-face block building which will include a booster pump room booster pump building including electrical room, restroom, and storage room. Five 2,400 gpm horizontal split case pumps (2 re-pump and 3 booster pumps), duplex grinder pump station, sump pump, process piping, valves, and appurtenances, motor-operated 3-ton bridge crane, HVAC system including fans, louvers, and associated duct work, control panel/PLC, switchboard and VFDs, low voltage power distribution equipment, lighting and receptacles, automatic transfer controller, 750 kw generator, fuel storage tank, and concrete pads, security panel and controls, and lightning protection system. Construction of one (1) 1.5 MG prestressed concrete ground storage tank with tank fill assembly (pressure reducing and sustaining valves), tank appurtenances, tank instrumentation with lightning protection system. A sodium hypochlorite feed and storage system with a duplex chemical pump skid, concrete pad, containment, and a pre-engineered metal building, one (1) double walled 2,500-gallon storage tank and appurtenances, chemical feed piping, valves, and appurtenances, lightning protection system, remote I/O cabinet, low voltage power distribution equipment, lighting and receptacles. All instrumentation, programming and electrical components including conduit, wires, motors, control panels, cabling, and other field instruments for a fully functioning system.

OWNER

Jacksonville Electric Authority
21 W. Church Street
Jacksonville, FL 32202
Brian Phillips
(904) 665-7625
philbr@jea.com

ENGINEER

Mott MacDonald
10245 Centurion Parkway, North
Suite 320
Jacksonville, FL 32256
Leslie Samel, P.E.
(904) 203-1090
leslie.samel@mottmac.com

Project Type

Bid/Build

Original Contract Amount

\$7,155,363.00

Final Contract Amount

\$7,155,363.00

Notice To Proceed Date

August, 2018

Contract Substantial Completion

March, 2020

Actual Substantial Completion

September, 2019



SAWCROSS, INC.

CONTRACTORS & ENGINEERS

CGC036203 EB8465

10970 New Berlin Road

Jacksonville, FL 32226

OFFICE: (904) 751-7500

FAX: (904) 751-0600

www.sawcross.com

PRECONSTRUCTION SERVICES

DESIGN BUILD

BID BUILD

DEP SRF Harbor Road Wastewater Treatment Facility, Phase 1

Green Cove Springs, Florida



This project consisted of the successful construction of a 1.25 MG pre-stressed concrete ground storage tank, two (2) 1,300 split-case reclaimed water high service pumps with 10,000-gallon hydropneumatics tank, electrical and controls with backup power generation, SCADA system with integration into the city's existing system, process yard piping, precast electrical building, precast manholes, a pre-engineered aluminum canopy and various site improvements. Challenges of the job also included working near high traffic railway lines, environmentally sensitive ecosystem, and coordination to keep existing plant operations online and undisturbed. This project was funded through the State Revolving Funds (SRF) and had to adhere to certain requirements for domestic manufacturing and Davis -Bacon wage rates. The timely completion of Phase I allowed for city utility officials to successfully apply for additional funding for critical Phase 2 infrastructure work.

OWNER

City of Green Cove Springs
321 Walnut Street
Green Cove Springs, FL 32043
Scott Schultz
(904) 219-7540
sschultz@greencovesprings.com

ENGINEER

Mittauer & Associates, Inc.
580-1 Wells Road
Orange Park, FL 32073
Jason Shepler
(904) 392-9536
jshepler@mittauer.com

Project Manager

Kevin DiQuisto

Project Type

Bid/Build

Original Contract Amount

\$3,407,385.00

Final Contract Amount

\$3,407,385.00

Notice To Proceed

May, 2019

Contract Substantial Completion

May, 2020

Actual Substantial Completion

May, 2020



SAWCROSS, INC.

CONTRACTORS & ENGINEERS

CGC036203 EB8465

10970 New Berlin Road
Jacksonville, FL 32226

OFFICE: (904) 751-7500

FAX: (904) 751-0600

www.sawcross.com

PRECONSTRUCTION SERVICES

DESIGN BUILD

BID BUILD



Mark Hickinbotham, PE

SAWCROSS INC. PRESIDENT

Project Assignment: Principal-In-Charge

Education

B.S., Mechanical Engineering,
Florida Atlantic University

Professional Registration

GA General Contractor
GCCO003348
GA Utility Contractor
UC300564
GA Utility Manager
UM000847
FL Professional Engineer
PE36099
FL General Contractor
CGC036203
FL Mechanical Contractor
CMC056728
FI Underground Utility
Contractor
C056787
FL Plumbing Contractor
CFC1427748
FL Pollutant Storage Systems
Contractor
PCC1256908

Experience

40 Years

Professional Affiliations

American Society of Mechanical
Engineers (ASME)

National Utility Contractors
Association (NUCA)

Publications

Patent #07-012-PTU-CL,
"Vacuum Flotation Separation
Technology"

Special Recognition

In 2002, The United States Navy
nominated Sawcross for *Design/Build
Project of the Year*. This was for the
diligent execution of their Phase II
Storm Drain Replacement project
that Mr. Hickinbotham was the
Project Manager.

Experience Summary

Mr. Hickinbotham started Sawcross, Inc. in 1992 as sole owner and President. He built his company by providing estimating, bidding, negotiation, contract administration and project management services, which he continues to provide to this day. He has over 40 years of experience in general, infrastructure and water-wastewater contracting, as well as consulting, mechanical-electrical equipment applications engineering. He continues to oversee all projects as Principle-In-Charge and head Project Manager. He has a proven track record of successful management and execution of all facets of treatment plants, pump station design and construction.

Selected Project Experience

- Belt Filter Press, City of Jacksonville Beach, \$715,000
- Lake Jackson WWTP, Talquin Electric, \$1,506,000
- Southeast WPCP Dewatering, City of Douglas, GA, \$1,313,000
- Repair WWTP and MCAS Beaufort, Dept. of the Navy, \$3,146,000
- Mayport Clarifiers, Dept. of the Navy, \$435,000
- Killearn Lakes WWTP, Talquin Electric, \$1,443,000
- Repair Site 6 Pier Utilities, Dept. of the Navy, \$2,529,000
- Arlington East Sludge Holding Tank, JEA, \$2,158,000
- WWTP Improvements, City of Winter Garden, \$1,706,000
- Water System Improvements, City of Monroe, GA, \$1,723,000
- Arlington East WRF Expansion, JEA, \$4,487,000
- Ridaught Landing Reclaimed Water Pump Station, CCUA, Middleburg, FL, \$1,454,000
- Atlantic Beach Reclaim Water Facility, City of Atlantic Beach, FL, \$1,251,032
- Buckman RMF Anaerobic Digesters 1 & 2 Cover Replacement, JEA, \$5,044,395
- Gadsden East WWTP, Talquin Electric, \$1,658,000
- Hendricks WTP Expansion, JEA, \$2,218,000
- Design-Build Phase II Storm Drain, NAS Jacksonville, \$4,054,000
- Summer Camp WTP & WWTP, St. Joe Company, \$3,278,000
- Nocatee Reclaim Water Storage and Pump Station, JEA, \$2,394,000
- Starke WWTP Upgrades, City of Starke, \$2,011,000
- Normandy WTP Upgrades, City of Deltona, \$1,409,000
- Arlington WTP Booster Pump Station & Fill Line, JEA, \$1,712,795
- Palm Coast WTP No. 3, City of Pam Coast, \$660,119
- Reclaimed Water Reservoir Outfall & Filtration, City of Port Orange, \$2,070,000
- City of Leesburg Plantation WTP Expansion, City of Leesburg, \$3,313,689
- Ponce De Leon WTP Pump Building and Reservoir Replacement, JEA, \$2,134,567
- State Road 16 WWTP 1.0 MG Reuse Ground Storage Tank, St. Johns County, Florida, \$1,041,690
- Fairfax WTP High Service Pump Rehabilitation, JEA, \$1,185,119
- Greenland Water Treatment Plant Improvement Project, JEA, \$5,486,154
- Southeast Water Treatment Plant High Service Pump Upgrades, JEA, \$3,078,108
- McMillian Wastewater Class III/IV Pumping Station Rehabilitation, JEA, \$10,454,785
- Eastern Wastewater Treatment Plant Expansion, City of Eustis, FL, \$7,501,069
- Lenox Class III-IV Pump Station Replacement, JEA, \$4,160,504
- US-1 South Re-Pump & Booster Pump Station, JEA, \$7,155,363
- Cecil Commerce Water Treatment Plant, JEA, \$3,838,906
- Iron Bridge Regional WRF Biosolids System Improvements, City of Orlando, FL, \$13,835,500



Drew Hickinbotham

SAWCROSS INC. PROJECT MANAGER

Project Assignment: Project Manager

Education

B.S., Building Construction
Minor, Business
Auburn University

Experience

11 Years

Certifications

OSHA 30 Hour
OSHA 10 Hour

Professional Affiliations

American Water Works
Association, Florida Section
(AWWA)

Design Build Institute of
America (DBIA)

Florida Water Environmental
Association (FWEA)

Experience Summary

Mr. Hickinbotham has worked in the construction industry for 10 years within the states of Georgia, South Carolina, and Florida, with 6 years exclusively for Sawcross as a project manager and estimator. He has direct experience in water treatment plants, wastewater treatment plants, and emergency high service pump station construction. His experience includes financial management, producing and sustaining construction scheduling, project coordination of superintendents and daily construction activities, engineering teams and clients, permitting and licensing, generating change orders, purchase orders and monthly pay applications to owners, negotiation, bidding and estimating. Additionally, he has familiarity with modern construction technology programs (BIM, Revit, AutoCAD, Primavera), proficient with Microsoft Office products, and has knowledge with the use of PROCORE, Submittal Exchange, IMPACT, E-Builder and other project management software.

Selected Project Experience

- **Sanford North WRF Tertiary Filtration Systems Improvements, Sanford, Florida – Current –**
Contract Amount: \$4,676,000.00
- **CCUA – Ridgecrest WTP Upgrades, Orange Park, Florida – October 2023 –**
Contract Amount: \$1,092,885.00
- **Southwest – Timuquana Pump Station Upgrade Project, Jacksonville, Florida – October 2023 –**
Contract Amount: \$3,758,000.00
- **Sanford Main WTP Improvements, Sanford, Florida – October 2023 – Contract Amount: \$7,563,635**
- **Marion Oaks Water Treatment Plant #4 Upgrades, Ocala, Florida – November 2019 –**
Contract Amount: \$1,423,000.00
- **St. Johns County Inlet Beach Master Pump Station Improvements Project, Ponte Vedra Beach, Florida – September 2019 – Contract Amount: \$1,101,000.00**
- **Main Street Water Treatment Plant – Well No. 15 Wellhead Assembly and Raw Water Main, Jacksonville, Florida – May 2019 - Contract Amount: \$704,000.00**
- **Anastasia Island WWTP Filter Replacement Project, St. Augustine, Florida – June 2018 –**
Contract Amount: \$901,000.00
- **Georgia Department of Public Safety New Service Building and Headquarters Upgrade, Atlanta, Georgia – August 2018 – Contract Amount: \$6,737,622.00**
- **Georgia Emergency Management Agency/Homeland Security Headquarters Expansion and Renovation, Atlanta, Georgia – October 2018 – Contract Amount: \$8,783,820.00**
- **Savannah-Chatham County Public Schools, May Howard Elementary School, Savannah, Georgia – October 2017 - Contract Amount: \$22,244,229.00**
- **Georgia College & State University (GC&SU) Renovation of Mayfair & McIntosh, Milledgeville, Georgia – July 2017 - Contract Amount: \$3,099,038.00**
- **Georgia State University (GSU) Center for Instructional Innovation, Atlanta, Georgia – July 2016 -**
Contract Amount: \$950,000.00
- **Fulton County East Roswell Library, Roswell, Georgia – December 2014 –**
Contract Amount: \$6,219,959.00
- **University of Georgia District Energy Plant (DEP-1) Chiller Addition, Athens, Georgia – December 2015 - Contract Amount: \$4,640,716.00**
- **Duval County Public Schools Douglas Anderson School of the Arts No. 107, Jacksonville, Florida – August 2015 - Contract Amount: \$13,500,000.00**
- **University of North Florida Osprey Clubhouse and Pool Facility, Jacksonville, Florida – August 2014**
Contract Amount: \$5,954,170.00



Josh Howell

SAWCROSS INC. SUPERINTENDENT

Project Assignment: Superintendent

Education

High School Diploma –
St. Cloud High School,
St. Cloud, FL

Experience

25 Years

Certifications

OSHA 30 Hour
OSHA 10

Experience Summary

Mr. Howell serves as a Superintendent and is responsible for the day-to-day construction activities for Sawcross, Inc. as well as its subcontractors. Josh has worked in the Florida construction industry for 17 years as a Superintendent of industrial and municipal water and wastewater treatment plants, water pumping station and sewer pumping station construction projects. Mr. Howell is extremely respected and well known in the industry for producing the very highest quality projects and on schedule. He is knowledgeable in all facets of plant construction including mechanical fitter, concrete, structures, all types of piping including stainless, ductile, PVC, HDPE and steel.

Selected Project Experience

- *Orlando – Iron Bridge Regional WRF Biosolids System Improvement – Sawcross INC. – Contract Amount: \$13,800,000 – Current*
- *Fort Myers – Wastewater Headworks Upgrade - Wharton Smith INC.- Contract Amount: \$7,000,000*
- *Jacksonville – Players Club WTP- 2 Clarifiers, Headworks, and grid equipment – Wharton Smith INC. – Contract Amount: \$25,000,000*
- *Fort Myers – Process Piping and Added on Cell Structure with new Grid Equipment – Wharton Smith INC. – Contract Amount: \$11,000,000*

SECTION 00301-A

SUBCONTRACTOR & SUPPLIER LIST

Will your firm be doing all the Work with your own forces? Yes No X (Check yes only if no subcontracting opportunities exist. If you will be doing portions of the Work with your own forces, list these areas and approximate dollar amount allocated for this Work. List suppliers).

List all proposed subcontractors and suppliers to be used to include company names, contractor license number, contact, addresses, phone numbers, type of work subcontracted (trade/commodity), and dollar amount of work. Provide all information requested. Use additional sheets if necessary.

Submit Update Subcontractor/Supplier List with each progress payment requested. Submit Final Subcontractor/Supplier List with Final Payment Request.

COMPANY NAME, CONTACT ADDRESS, PHONE NUMBER	WORK TO BE PERFORMED (TRADE) OR COMMODITY TO BE SUPPLIED	ESTIMATED DOLLAR AMOUNT
1 Carter Electric, Inc. 450 Marshall Lake Rd Apopka, FL 32703 407-814-2677	Electrical	\$1,790,200.00
2 Telemetry & Process Controls, Inc. 7250 Hudson Blvd, Ste 160 Oakdale, MN 55128 651-430-0435	Instrumentation & SCADA	\$486,502.00
3		
4		
5		
6		
7		

END OF SECTION

SECTION 00302

COMPLIANCE WITH FLORIDA TRENCH SAFETY ACT
(90-96, LAWS OF FLORIDA)

Bidder hereby acknowledges that all costs for complying with the Florida Trench Safety Act are included in the various items of the bid and in the Lump Sum Total Bid Price shown in Section 00300 - Bid Form, "Schedule of Bid Items". For informational purposes only, the bidder is required to further identify these costs in the summary below.

	Trench Safety Measure (Description)	Unit of Measure (LF, SY)	Unit (Quantity)	Unit Cost	Extended Cost
A	Sloped Sides	LF	120	\$ 10.00	\$ 1,200.00
B				\$	\$
C				\$	\$
D				\$	\$
				TOTAL	\$ 1,200.00

BIDDER: Sawcross, Inc.SIGNED: BY: Mark Hickinbotham
(Print or type name)TITLE: PresidentDATE: 4/8/2024

THIS IS NOT A PAY ITEM: The purpose of this form is to gather information on the costs associated with trench safety measures and to ensure Bidder has considered these costs and included them in the Lump Sum Total Bid price. Contractor will not receive additional payment if actual quantities differ from those estimated or if the Contractor uses a safety measure different than those listed.

(Failure to complete this Form may result in the Bid being declared non-responsive.)

END OF SECTION

SECTION 00303

DRUG-FREE WORKPLACE CERTIFICATION

IDENTICAL TIE BIDS: Preference shall be given to businesses with drug-free workplace programs. In accordance with Florida Statute 287.087, whenever two or more bids that are equal with respect to price, quantity, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a bid from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, and available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or *nolo contendere* to, any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program is such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Bidder: Sawcross, Inc.

Signed: 

By: Mark Hickinbotham
(Print or Type Name)

Title: President

Date: 4/8/2024

END OF SECTION

SECTION 00310

CONTRACTOR E-VERIFY AFFIDAVIT

I hereby certify that Sawcross, Inc. [contractor] does not employ, contract with, or subcontract with an unauthorized alien, and is otherwise in full compliance with Section 448.095, Florida Statutes.

All employees hired on or after January 1, 2021 have had their work authorization status verified through the E-Verify system.

A true and correct copy of Sawcross, Inc. [contractor] proof of registration in the E-Verify system is attached to this Affidavit.



Print Name: Mark Hickinbotham, President

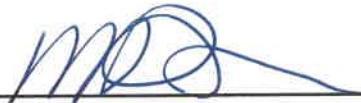
Date: 4/8/2024

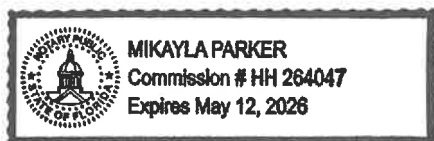
STATE OF Florida

COUNTY OF Duval

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization, this April 8, 2024 (date) by Mark Hickinbotham, President (name of officer or agent, title of officer or agent) of Sawcross, Inc. (name of contractor company acknowledging), a Florida (state or place of incorporation) corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ (type of identification) as identification.

[Notary Seal]



Notary Public

Mikayla Parker
Name typed, printed or stamped

My Commission Expires: 5/12/2026

SECTION 00311

SAM.GOV REGISTRATION INFORMATION

In accordance with applicable federal requirements, the City of Ocoee will verify all bidders on SAM.gov (System for Award Management) for federal debarment or suspension exclusions as a responsibility determination. The City of Ocoee requires the successful Bidder to register with Sam.gov, if not already registered, prior to execution of this contract.

Contractor: Sawcross, Inc.

Unique Entity ID (UEI) number: EGFVJZNUN3R2

CAGE Code: 0YVN1

Physical Address: 10970 New Berlin Rd
Jacksonville, FL 32226-2270

Expiration date of Registration: 9/20/2024

SECTION 00312

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

The undersigned, [Company] Sawcross, Inc. certifies, to the best of his or her knowledge, that:

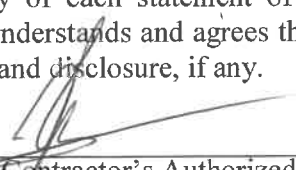
1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Contractor, [Company] Sawcross, Inc., certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 *et seq.*, apply to this certification and disclosure, if any.


Signature of Contractor's Authorized Official

Mark Hickinbotham, President
Name and Title of Contractor's Authorized Official

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00312-1

SECTION 00313

CONFIDENTIAL DISCLOSURE AGREEMENT

This Agreement is entered into by and between Sawcross, Inc.
(hereinafter "Recipient") and the City of Ocoee (hereinafter "City").

RECITALS

WHEREAS, City needs to disseminate certain building plans, blueprints, specifications, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a water treatment facility ("design information"), in order for it to be designed and constructed pursuant to **ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid** (the Project); and

WHEREAS, such design information is exempt from public records disclosure requirements of Florida Statutes Section 119.07(1) and s. 24(a), Art. I of the Florida State Constitution. This exemption provides that design information made exempt by law may be disclosed to another governmental entity if disclosure is necessary for the receiving entity to perform its duties and responsibilities; to a licensed architect, engineer, or contractor who is performing work on or related to a public building or water treatment facility; and that the entities or persons receiving such information shall maintain the exempt status; and

WHEREAS, Recipient is willing to receive disclosure of the design information pursuant to the terms of this Agreement for the purpose of bidding on the project and/or performing design services;

NOW THEREFORE, for good and sufficient consideration Recipient agrees as follows:

1. The above Recitals are acknowledged by Recipient and are incorporated herein by reference.
2. Recipient agrees that it shall prevent and protect the design information, or any part thereof, from disclosure as a public record and shall not disclose the design information to

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

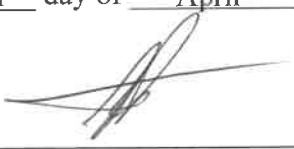
any person or entity other than one having a need for disclosure in connection with Recipient's authorized use of the design information for the purposes of submitting a response to the bid solicitation.

3. Recipient agrees to take all steps reasonably necessary to protect the secrecy of the design information, and to require all entities or persons receiving the design information to maintain its exempt status and to prevent the design information from being disclosed as a public record or coming into the possession of a person or entity that is not authorized.

4. Recipient agrees that all design information shall remain the property of City. All design information and all copies thereof shall be returned to City not later than thirty (30) days after the bid opening together with a list of all of the names and addresses of all entities or persons to which the design information has been disclosed; or, in the case of a designer, not later than thirty (30) days after the project is finally completed.

Dated this 8th day of April, 2024 .

RECIPIENT

Signed:  _____

Print Name: Mark Hickinbotham

Title: President

Company: Sawcross, Inc.

Address: 10970 New Berlin Road

Jacksonville, FL 32226

Phone No: 904-751-7500

Date: 4/8/2024

SECTION 00314

**ANSWERS TO QUESTIONS RECEIVED AND/OR
AMENDMENTS TO THE BIDDING DOCUMENTS**

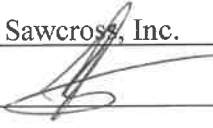
Bidder must complete and submit this form with Bid. By signing below, Bidder acknowledges Bidder has examined the answers to questions received and/or amendments to the Bidding Documents contained within this document.

1. **The PICS Supplier referenced in Section 13600 1.03A(1)(i) is amended to Telemetry Process Controls, Oakdale, MN, (651) 430-0435.**
- Q1. Who installs the VFDs? Section 1.03A and 2.01A4 state differences on who installs the VFDs.
- A1. **The VFDs are supplied by Telemetry Process Controls as stated as an allowance in Bid Item 4.2. Contractor is responsible for the installation and wiring of the VFDs. Start-up and testing are provided by TPC.**
- Q2. Typo of VFD Quantity: Not MCC1 and MCC2, SB-1 and SB-2? What is the correct quantity of VFDs?
- A2. **There are eight (8) VFDs, two (2) for the blowers and six (6) for the rotors.**
- Q3. Can you confirm if the new blower piping is to be Ductile Iron like the existing? Any Lining requirements?
- A3. **Yes, the new blower piping will be ductile iron. Bare interior pipe, no liner.**
- Q4. This project states through ARPA/SLFRF funding that it has Davis Bacon Wage Requirements. Upon further review, it says in the Division 0 documents that the wages only apply to contracts exceeding \$10 million. Can you clarify?
- A4. **Since the funding is from the ARPA grant, the Davis Bacon requirements would only apply if the contract amount is over \$10 million as the Treasury waived the Davis Bacon requirements for contracts under that amount.**
- Q5. I work on bids at Hach. I came across Ocoee WWTF Electrical Upgrade and Expansion. It states for the digital indicator that the manufacturer is Newport Electronics, Precision Digital or approved equal. Would Hach be considered an approved equal?
- A5. **Bid per the specifications and the Bid Documents. If the contractor wants to substitute during construction, they send a request to the engineer who answers the question. See also Article 10 of the Instructions to Bidders - Substitute Material and Equipment.**

Q6. I would like to propose Yaskawa as an acceptable manufacturer for the VFD portion of this job. Section 16370:1.02.E -Add Yaskawa America Inc.

A6. Bid per the specifications and the Bid Documents. See also Article 10 of the Instructions to Bidders - Substitute Material and Equipment. If the contractor wants to substitute during construction, they send a request to the engineer who answers the question. Additionally, the City's standard VFD is manufactured by Danfoss. Refer to Section 16370, 1.02 E – Approved Manufacturer.

BIDDER: Sawcross, Inc.

SIGNED: 

BY: Mark Hickinbotham
(Print or type name)

TITLE: President

DATE: 4/8/2024

END OF SECTION

SECTION 00410

BID BOND

Bidder shall provide the City with a Bid Bond in the amount of five percent (5%) of the contract bid.

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, Sawcross, Inc.
, as Principal, and Western Surety Company
 as Surety, are hereby held and firmly bound unto the City of Ocoee,
Florida, as Owner, in the penal sum of, (5 percent of the Contract Bid) \$ 194,912.60
One hundred ninety-four thousand nine hundred twelve dollars and sixty cents.

(written amount in dollars and cents)

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this 8th day of April, 2024. The Condition of the above obligation is such that whereas the Principal has submitted to the City of Ocoee, Florida a certain Bid, attached hereto and hereby made a part hereof to enter into a contract in writing, for the Project: "ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid".

NOW THEREFORE

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder any damages, costs, or expenses, including attorney's fees, incurred by Owner that are proximately caused by such default. In no event shall Bidder's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents,

or

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00410-1

- 3.2 All bids are rejected by Owner, or
- 3.3 Owner fails to issue a Notice of Intent to Award to Bidder within ninety (90) days from the time and date fixed for the opening of Bids (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
 5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the total time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from Bid Due Date without Surety's written consent.
 6. No suit or action shall be commenced under this bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid Due Date.
 7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
 8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
 9. Surety shall cause to be attached to this Bond, a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
 10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
 11. The term "bid" as used herein includes a bid, offer, or proposal as applicable.

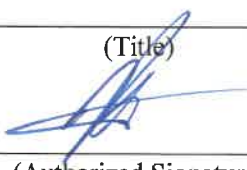
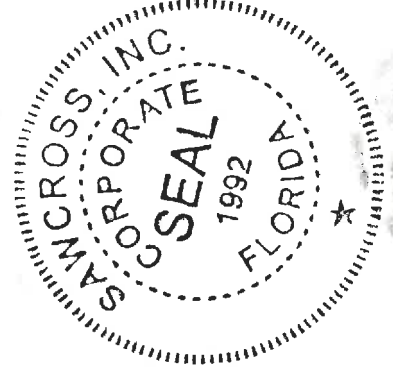
IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

BIDDER:	Strike out (X) non-applicable signature blocks and complete applicable block. All signatures must have their names printed or type below their signature.
---------	--

If Bidder is SOLE PROPRIETORSHIP , complete this signature block.	
_____ (Individual's Signature)	(1) _____ (Witness)
_____ (Individual's Signature)	(2) _____ (Witness)
doing business as _____	(SEAL)
_____ (Business Address)	
_____ (Telephone No.) _____ (Florida License No.)	

If Bidder is **PARTNERSHIP, complete this signature block.**

_____ (Partnership Name) _____ (General Partner's Signature) _____ (General Partner's Name) _____ (Business Address) _____ (Telephone No.)	(1) _____ (Witness) (2) _____ (Witness) (SEAL)
_____ (Florida License No.)	

If Bidder is CORPORATION , complete this signature block.	
<u>Sawcross, Inc.</u> (Corporation Name) <u>Florida</u> (State of Incorporation) By: <u>Mark Hickinbotham</u> (Name of Person Authorized to Sign - See Note 1) <u>President</u> (Title)  (Authorized Signature) <u>Mark Hickinbotham</u> (Corporation President) <u>10970 New Berlin Road</u> <u>Jacksonville, FL 32226</u> (Business Address) <u>(904) 751-7500</u> <u>CGC036203</u> (Telephone No.) (Florida License No.)	(1) <u></u> (Witness) (2) <u></u> (Witness) (SEAL) 

SURETY

<u>Western Surety Company</u> (Surety Business Name) <u>151 N. Franklin Street, Chicago, IL 60606</u> (Principal Place of Business) By: <u><i>Allyson Foss Wing</i></u> (Surety Agent's Signature - See Note 2) <u>Allyson Foss Wing</u> (Surety Agent's Name) <u>Attorney-in-Fact & FL Licensed Resident Agent</u> (Surety Agent's Title) <u>Guignard Company</u> (Business Name of Local Agent for Surety) <u>1904 Boothe Circle, Longwood, FL 32750</u> (Business Address) <u>407-834-0022</u> <u>N/A</u> (Telephone No.) (Bond No.)	<u>Witness: (If agency is not a Corporation)</u> (1) _____ (Witness) (2) _____ (Witness) <u>Attest: (If Agency is a Corporation)</u> <u><i>Margie L. Morris</i></u> (Corporate Secretary Signature) <u>Margie L. Morris</u> (Corporate Secretary Name) (Corporate Seal) 
---	--

NOTES:

- (1) Complete and attach "Corporate Authority to Execute Documents" if executed by any corporate employee other than president or vice-president.
- (2) Complete and attach a certified copy of "Power-of-Attorney" prepared by Surety appointing individual "Attorney-in-Fact" for execution of Bid Bond on behalf of Surety and corresponding notarized "Attorney-in-Fact".
- (3) Above addresses are to be used for giving required notice.
- (4) Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.
- (5) Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

ATTORNEY-IN-FACT AFFIDAVIT

STATE OR COMMONWEALTH OF Florida)

COUNTY OR CITY OF Seminole County, City of Longwood)

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization, this 8th day of April, 2024 by Allyson Foss Wing as Attorney-in-Fact, who is ~~personally known to me~~ or who has produced N/A as identification on behalf of Western Surety Company, a South Dakota Corporation, (Surety Company) (State) which executed the attached bond as surety, who deposed and said that his signature and the corporate seal of said Western Surety Company were affixed by order and authority of said (Surety Company)

Company's Board of Directors, and that the execution of the attached bond is the free act and deed of Western Surety Company. (Surety Company)

Given under my hand and seal this 8th day of April, 2024.




April L. Lively (Notary Public)

My Commission Expires 02/17/2025

END OF SECTION

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

Bryce R Guignard, M Gary Francis, April L Lively, Jennifer L Hindley, Margie L Morris, Allyson Foss Wing, Deborah Ann Defoe, Christine A Morton, Kelly Phelan, David R Turcios, Mariel Urchipia, Amanda Jo Herstine, Individually

of Longwood, FL, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the Authorizing By-Laws and Resolutions printed at the bottom of this page, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 14th day of February, 2024.



WESTERN SURETY COMPANY

Larry Kasten, Vice President

State of South Dakota }
County of Minnehaha } ss

On this 14th day of February, 2024, before me personally came Larry Kasten, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is a Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

March 2, 2026



M. Bent, Notary Public

CERTIFICATE

I, Paula Kolsrud, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law and Resolutions of the corporation printed below this certificate are still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 8th day of April, 2024.



WESTERN SURETY COMPANY

Paula Kolsrud, Assistant Secretary

Authorizing By-Laws and Resolutions

ADOPTED BY THE SHAREHOLDERS OF WESTERN SURETY COMPANY

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the shareholders of the Company.

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, and Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

This Power of Attorney is signed by Larry Kasten, Vice President, who has been authorized pursuant to the above Bylaw to execute power of attorneys on behalf of Western Surety Company.

This Power of Attorney may be signed by digital signature and sealed by a digital or otherwise electronic-formatted corporate seal under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 27th day of April, 2022:

"RESOLVED: That it is in the best interest of the Company to periodically ratify and confirm any corporate documents signed by digital signatures and to ratify and confirm the use of a digital or otherwise electronic-formatted corporate seal, each to be considered the act and deed of the Company."

Go to www.cnasurety.com > Owner / Obligor Services > Validate Bond Coverage, if you want to verify bond authenticity.

SECTION 00480

NON-COLLUSION AFFIDAVIT

STATE OF Florida
COUNTY OF Duval

Mark Hickinbotham, being first duly sworn deposes and says:

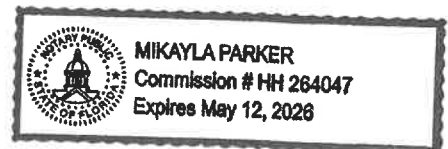
1. He/She is the President
(Owner, Partner, Office, Representative or Agent)
of Sawcross, Inc., the Bidder that has submitted the attached Bid;
2. He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
3. Such Bid is genuine and is not a collusive or sham Bid;
4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affidavit, have in any way, colluded, conspired, connived or agreed, directly or indirectly, with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted; or to refrain from bidding in connection with such Contract; or have in any manner, directly or indirectly, sought by agreement or collusion, or communication, or conference with any Bidder, firm, or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit, or cost elements of the Bid price or the Bid price in any other Bidder, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against (Recipient), or any person interested in the proposed Contract;
5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any other of its agents, representatives, owners, employees or parties in interest, including this affidavit.

By: [Signature]
Title: Mark Hickinbotham, President

Sworn to and subscribed before me by means of ☒ physical presence or ☐ online notarization, this 8th day of April, 2024, by Mark Hickinbotham in the state of Florida County of Duval.

[Signature]
Notary Public

My Commission Expires: 5/12/2026



END OF SECTION



BID CONFLICT OF INTEREST DISCLOSURE FORM

Award of this contract is subject to the provisions of Chapter 112, Florida Statutes. All Bidders must disclose within their Bid: the name of any City of Ocoee employee, Mayor or City Commissioner, other City Official, or City Consultants, who owns assets or capital stock, directly or indirectly, in the Bidder's firm or any of its branches, or would directly or indirectly benefit by the profits or emoluments of this Bid. (Indirect ownership or benefit applies to any members of his or her immediate family.) Bidder certifies that no member of the entity's ownership or management is presently applying for an employee position or actively seeking an elected position with the City. In the event that a conflict of interest is identified in the provision of services, Bidder agrees to immediately notify the City in writing.

The purpose of this disclosure form is to give the City the information needed to identify potential conflicts of interest for the City Commission, Staff, and other key City employees and consultants involved in the award and administration of this contract.

According to Chapter 112, Florida Statutes, the term "conflict of interest" "means a situation in which regard for a private interest tends to lead to disregard of a public duty or interest", and refers to situations in which financial or other personal considerations may adversely affect, or have the appearance of adversely affecting, an employee's professional judgment in exercising any City duty or responsibility in administration, management, instruction, research, or other professional activities.

Please check one of the following statements and attach additional documentation if necessary:

- ☒ To the best of our knowledge, the undersigned firm has no potential conflict of interest for this Bid.
- ☐ The undersigned firm, by attachment to this form, submits information which may be a potential conflict of interest for this Bid.

Acknowledged by:

Sawcross, Inc.
Firm Name

Signature

Mark Hickinbotham, President
Name and Title (Print or Type)

4/8/2024
Date

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00480-a

SECTION 00481

CERTIFICATION OF NONSEGREGATED FACILITIES

Bidder certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under this control, where segregated facilities are maintained. The Bidder certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The Bidder agrees that a breach of this certification will be a violation of the Equal Opportunity clause in any contract resulting from acceptance of this Bid. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage and dressing areas, parking lots, drinking fountains, recreation or entertainment area, transportation, and housing facilities provided for employees on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. Bidder agrees that (except where he has obtained identical certification from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

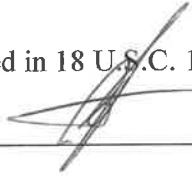
The nondiscriminatory guidelines as promulgated in Section 202, Executive Order 11246, and as amended by Executive Order 11375 and as amended, relative to Equal Opportunity for all persons and implementations of rules and regulations prescribed by the United States Secretary of Labor are incorporated herein.

Note:

The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date April 8, 2024.

By:



Mark Hickinbotham

President

(Title)

Official Address (including Zip Code):

10970 New Berlin Road

Jacksonville, FL 32226

ATTACH AND INCLUDE AS PART OF BID FORM; FAILURE TO DO SO MAY BE CAUSE FOR DISQUALIFICATION OF YOUR BID.

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00481-1

SECTION 00482

SWORN STATEMENT UNDER SECTION 287.133(3)(a),
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER
OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. 1. This sworn statement is submitted to City of Ocoee, Florida by Sawcross, Inc.
(Entity)
by Mark Hickinbotham, President
(Print individual's Name & Title)
whose business address is 10970 New Berlin Road, Jacksonville, FL 32226

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material representation.
3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
- a. A predecessor or successor of a person convicted of a public entity crime: or
 - b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a *prima facie* case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

- X Neither the entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of this entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of this entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding concerning the conviction before a Hearing Officer of the State of Florida, Division of Administrative Hearings. The final order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (Please attach a copy of the final order.)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY, AND THAT THIS FORM IS VALID FOR A PERIOD OF ONE YEAR. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES, FOR CATEGORY TWO OF CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

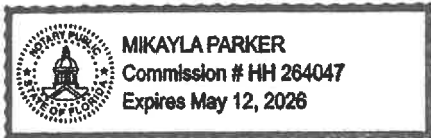
Date: 4/8/2024

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

STATE OF Florida

COUNTY OF Duval

Sworn to (or affirmed) and subscribed before me by means of ☒ physical presence or ☐ online notarization, this 8th day of April, 2024 by Mark Hickinbotham, President affixed his/her signature in the place provided above on this 8th day of April, 2024.



Notary Public 

My Commission Expires: 5/12/2026

END OF SECTION

SECTION 00483

CERTIFICATION OF NONDISCRIMINATORY LABOR PRACTICES

This certification relates to a construction contract proposed by the City of Ocoee for ITB #24-008.

Equal Opportunity Employment: The Contractor shall not discriminate on the basis of race, color, national origin, gender, age, handicapped status, veteran status, and/or religion in performing the work governed by this contract. The City is an Equal Opportunity Employer (EOE) and as such encourages all contractors to comply with EOE regulations. Any subcontract the Contractor may enter into shall include this clause with the same degree of application being encouraged.

I am the undersigned prospective construction contractor or subcontractor. I certify that:

- (1) I have X I have not _____ participated in a previous contract or subcontract subject to the Equal Opportunity Clause and
- (2) if I have participated in a previous contract or subcontract subject to the Equal Opportunity Clause, I have X I have not _____ filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs, or the Equal Employment Opportunity Commission all reports due under the applicable filing requirements.

I understand that, if I have participated in a previous contract or subcontract subject to the Equal Opportunity Clause and have failed to file all reports due under the applicable filing requirements, I am not eligible, and will not be eligible, to have my bid or offer considered, or to enter into the proposed contract or subcontract, unless and until I make an arrangement regarding such reports that is satisfactory to the office where the reports are required to be filed.

I agree that I will obtain identical certifications from prospective lower-tier sub-contractors when I receive bids or offers or initiate negotiations for any lower-tier construction subcontracts with a price exceeding \$10,000. I also agree that I will retain such certifications in my files.

Date April 8 , 20 24 .

By: _____
(Signature of Authorized Official)

Sawcross, Inc.
(Name of Construction Contractor or Subcontractor)

10970 New Berlin Rd, Jacksonville, FL 32226
(Address of Construction Contractor or Subcontractor)

904-751-7500
(Telephone Number)

59-3136689
(Employer Identification No.)

END OF SECTION

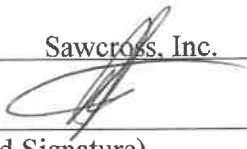
Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

SECTION 00484

CERTIFICATION REGARDING SCRUTINIZED COMPANIES' LISTS

Bidder certifies that the company is not participating in a boycott of Israel. Bidder certifies that Bidder is not on the Scrutinized Companies that Boycott Israel List, not on the Scrutinized Companies with Activities in Sudan List, not on the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, and is not engaged in business operations in Cuba or Syria, as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that Bidder is unable to provide such certification but still seeks to be considered for award of this solicitation, Bidder shall, on a separate piece of paper, clearly state that it is on one or both of the Scrutinized Companies lists and shall furnish together with its proposal a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. Bidder agrees to cooperate fully with the City in any investigation undertaken by the City to determine whether the claimed exception would be applicable. City shall have the right to terminate any contract resulting from this solicitation for default if Bidder is found to have submitted a false certification, or to have been placed on the Scrutinized Companies that Boycott Israel List, or to have been placed on the Scrutinized Companies for Activities in Sudan List, or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria.

Bidder: Sawcross, Inc.

By: 
(Authorized Signature)

Printed Name and Title: Mark Hickinbotham, President

Date: 4/8/2024

END OF SECTION

Request for Taxpayer Identification Number and Certification

Give Form to the
requester. Do not
send to the IRS.

► Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type.
See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Sawcross, Inc.

2 Business name/disregarded entity name, if different from above

Same As Above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC

☐ C Corporation

☒ S Corporation

☐ Partnership

☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ►

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ►

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

10970 New Berlin Road

6 City, state, and ZIP code

Jacksonville, Florida 32226

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

____ - ____ - ____

or

Employer identification number

5 9 - 3 1 3 6 6 8 9

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign
Here

Signature of
U.S. person ►

Mark Hickinbotham

Date ►

04/08/2024

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.

ACORD™

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

12/28/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

PRODUCER USI Insurance Svcs LLC, CL 4600 Touchton Rd Building 100, Suite 275 Jacksonville, FL 32246	CONTACT NAME: Amanda Schneider		
	PHONE (A/C, No, Ext): 352-390-2768	FAX (A/C, No):	
	E-MAIL ADDRESS: Amanda.Schneider@usi.com		
INSURED Sawcross, Inc. 10970 New Berlin Road Jacksonville, FL 32226	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: National Fire Insurance Co. of Hartford		20478
	INSURER B: Continental Insurance Company		35289
	INSURER C: Valley Forge Insurance Company		20508
	INSURER D: AXIS Surplus Insurance Company		26620
	INSURER E: Continental Casualty Company		20443
INSURER F:			

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR ☒ PD Ded:5,000 GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PROJECT ☐ LOC OTHER:		7036358631	01/01/2024	01/01/2025	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$500,000 MED EXP (Any one person) \$15,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$
A	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ OWNED AUTOS ONLY ☒ HIRED AUTOS ONLY ☐ SCHEDULED AUTOS ☒ NON-OWNED AUTOS ONLY		7036358628	01/01/2024	01/01/2025	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
B	☒ UMBRELLA LIAB ☒ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☒ RETENTION \$10000		7036358614	01/01/2024	01/01/2025	EACH OCCURRENCE \$5,000,000 AGGREGATE \$5,000,000 \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☒ N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	7036462181	01/01/2024	01/01/2025	☒ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT \$500,000 E.L. DISEASE - EA EMPLOYEE \$500,000 E.L. DISEASE - POLICY LIMIT \$500,000
D	Poll/Prof Liab		CM004461032023	01/01/2024	01/01/2025	\$1,000,000
E	Leased/ Rent Equi		7036484214	01/01/2024	01/01/2025	\$500,000
E	Installation Cov		7036484214	01/01/2024	01/01/2025	\$2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Physical Damage Coverage provided under Inland Marine policy for the following items: 1998 Custom Craft 8x32 Office Trailer VIN # 5650 1997 Design Space 8x32 Office Trailer VIN # DS14927 Physical Damage Coverage provided under Business Auto policy for the following item: 1972 Storage Van Tool Trailer VIN # W10515

CERTIFICATE HOLDER

CANCELLATION

Sawcross, Inc.
10970 New Berlin Road
Jacksonville, FL 32226-0000

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE





Ron DeSantis, Governor

Melanie S. Griffin, Secretary



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

HICKINBOTHAM, MARK EDWARD

SAWCROSS INC
10970 NEW BERLIN ROAD
JACKSONVILLE FL 32226-2270

LICENSE NUMBER: CGC036203

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at [MyFloridaLicense.com](https://myfloridalicense.com)



Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.



My Company Account

My Company Profile

Company Information

Company Name

Sawcross, Inc.

Doing Business As (DBA) Name

Company ID

906931

Enrollment Date

Sep 03, 2015

Employer Identification Number (EIN)

593136689

Unique Entity Identifier (UEI)

DUNS Number

791309834

Total Number of Employees

100 to 499

NAICS Code

238

Sector

Construction

Subsector

Specialty Trade Contractors

[Edit Company Information](#)

Employer Category

Employer Category

None of these categories apply

[Edit Employer Category](#)

Company Addresses

Physical Address

10970 New Berlin Road
Jacksonville, FL 322262270

Mailing Address

Same as Physical Address

[Edit Company Addresses](#)

Hiring Sites

We have implemented a new policy and require more information for existing and future hiring sites.

Number of Sites

1

[Edit Hiring Sites](#)

Company Access and MOU

My Company is Configured to:

Verify Its Own Employees

Memorandum of Understanding

[View Current MOU](#)

[U.S. Department of Homeland Security](#)

[U.S. Citizenship and Immigration Services](#)

[Accessibility](#)

[Plug-ins](#)





[Department of State](#) / [Division of Corporations](#) / [Search Records](#) / [Search by Entity Name](#) /

Detail by Entity Name

Florida Profit Corporation

SAWCROSS, INC.

Filing Information

Document Number	V55559
FEI/EIN Number	59-3136689
Date Filed	07/31/1992
State	FL
Status	ACTIVE
Last Event	AMENDMENT
Event Date Filed	12/12/2022
Event Effective Date	NONE

Principal Address

10970 NEW BERLIN ROAD
JACKSONVILLE, FL 32226-2270

Changed: 01/06/2011

Mailing Address

10970 NEW BERLIN ROAD
JACKSONVILLE, FL 32226-2270

Changed: 01/06/2011

Registered Agent Name & Address

HICKINBOTHAM, MARK E
8127 WEKIVA LANE
JACKSONVILLE, FL 32256

Address Changed: 01/09/2004

Officer/Director Detail

Name & Address

Title D

HICKINBOTHAM, MARK E
8127 WEKIVA LANE
JACKSONVILLE, FL 32256

Title VP

HICKINBOTHAM, FRANCES T
8127 WEKIVA LANE
JACKSONVILLE, FL 32256

Title S

HICKINBOTHAM, FRANCES T
8127 WEKIVA LANE
JACKSONVILLE, FL 32256

Title P

HICKINBOTHAM, MARK E
8127 WEKIVA LANE
JACKSONVILLE, FL 32256

Annual Reports

Report Year	Filed Date
2021	01/06/2021
2022	01/26/2022
2023	01/10/2023

Document Images

01/10/2023 – ANNUAL REPORT	View image in PDF format
12/12/2022 – Amendment	View image in PDF format
01/26/2022 – ANNUAL REPORT	View image in PDF format
01/06/2021 – ANNUAL REPORT	View image in PDF format
01/16/2020 – ANNUAL REPORT	View image in PDF format
02/05/2019 – ANNUAL REPORT	View image in PDF format
01/09/2018 – ANNUAL REPORT	View image in PDF format
01/10/2017 – ANNUAL REPORT	View image in PDF format
01/25/2016 – ANNUAL REPORT	View image in PDF format
02/21/2015 – ANNUAL REPORT	View image in PDF format
01/03/2014 – ANNUAL REPORT	View image in PDF format
02/07/2013 – ANNUAL REPORT	View image in PDF format
01/05/2012 – ANNUAL REPORT	View image in PDF format
01/06/2011 – ANNUAL REPORT	View image in PDF format
01/08/2010 – ANNUAL REPORT	View image in PDF format
03/02/2009 – ANNUAL REPORT	View image in PDF format
01/17/2008 – ANNUAL REPORT	View image in PDF format
07/05/2007 – ANNUAL REPORT	View image in PDF format
02/06/2006 – ANNUAL REPORT	View image in PDF format
02/24/2005 – ANNUAL REPORT	View image in PDF format
01/09/2004 – ANNUAL REPORT	View image in PDF format
01/21/2003 – ANNUAL REPORT	View image in PDF format

02/11/2002 – ANNUAL REPORT	View image in PDF format
01/26/2001 – ANNUAL REPORT	View image in PDF format
01/26/2000 – ANNUAL REPORT	View image in PDF format
02/15/1999 – ANNUAL REPORT	View image in PDF format
01/29/1998 – ANNUAL REPORT	View image in PDF format
06/18/1997 – ADDRESS CHANGE	View image in PDF format
01/29/1997 – ANNUAL REPORT	View image in PDF format
01/30/1996 – ANNUAL REPORT	View image in PDF format
02/03/1995 – ANNUAL REPORT	View image in PDF format

Florida Department of State, Division of Corporations

From: [Justin Hanson](#)
To: [Hopper, Shannon](#); [Mark Hickinbotham](#); [Mikayla Parker](#)
Cc: [Tolbert, Joyce](#); [Chentouf, Alexis](#)
Subject: RE: Request for Clarification - ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - REBID
Date: Wednesday, May 1, 2024 3:04:36 PM
Attachments: [SOV for 4.1.pdf](#)

Hi Shannon,
See attached breakdown of Item 4.1 from the bid form as requested. Please let us know if you need any additional information.

Thank you,



Justin Hanson

Project Manager – **Estimator**

justinh@sawcross.com

Phone: (904) 751-7500 Ex. 127 | Cell: (904) 772-4611

10970 New Berlin Road, Jacksonville, FL 32226-2270

<https://link.edgепilot.com/s/47af4666/HQn9BkSrTEO7TgtUIqjAWQ?u=http://www.sawcross.com/> | Bid Room:
<https://link.edgепilot.com/s/28c56a07/mle1TRWwAU2PfP1PqmSetw?u=http://www.sawcross.com/bids>

From: Hopper, Shannon <SHopper@ocoe.org>
Sent: Monday, April 29, 2024 6:54 PM
To: Justin Hanson <justinh@sawcross.com>
Cc: Tolbert, Joyce <JTolbert@ocoe.org>; Chentouf, Alexis <AKnight@ocoe.org>
Subject: Request for Clarification - ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - REBID

Good afternoon, Justin:

The City is requesting clarification from the three apparent low bidders for ITB #24-008 pertaining to section 4.1 of the bid form. Please provide me with a breakdown/schedule of values for 4.1 of the Bid Form. I am requesting that you reply to all and send to me by this Wednesday, May 2 at 2:00 p.m., if possible, as I will be out of the office on Thursday and Friday.

Thank you,
Shannon

Shannon Hopper

Purchasing Technician
City of Ocoee
1 N. Bluford Avenue
Ocoee, FL 34761

☎PH: 407-905-3100 x 1524

✉E-mail: shopper@ocoe.org

Website: https://link.edgepilot.com/s/1954de7c/n8_Qeh2feEmRq3R8I0sV6Q?u=http://www.ocoe.org/

Florida has a very broad public records law (F.S. 119). As a result, any written communication created or received by City of Ocoee officials and employees will be made available to the public and media, upon request, unless otherwise exempt. Additionally, under Florida Law email addresses are public records.

From: Hopper, Shannon

Sent: Thursday, April 25, 2024 5:04 PM

To: 'Justin Hanson' <justinh@sawcross.com>

Subject: RE: Ocoee WWTF Electrical Upgrade and Expansion

Hi, Justin:

All Bids are currently being reviewed. I will let you know if there is anything additional that is needed.

Have a great day!

Shannon

Shannon Hopper

Purchasing Technician

City of Ocoee

1 N. Bluford Avenue

Ocoee, FL 34761

☎PH: 407-905-3100 x 1524

✉E-mail: shopper@ocoe.org

Website: https://link.edgepilot.com/s/1954de7c/n8_Qeh2feEmRq3R8I0sV6Q?u=http://www.ocoe.org/

Florida has a very broad public records law (F.S. 119). As a result, any written communication created or received by City of Ocoee officials and employees will be made available to the public and media, upon request, unless otherwise exempt. Additionally, under Florida Law email addresses are public records.

From: Justin Hanson <justinh@sawcross.com>

Sent: Thursday, April 25, 2024 12:32 PM

To: Hopper, Shannon <SHopper@ocoe.org>

Subject: Ocoee WWTF Electrical Upgrade and Expansion

Hi Shannon,

Checking in one the subject project. Pleased let us know of any updates when you have a chance.

Thank you,

Justin Hanson
Project Manager – Estimator
Sawcross, Inc.
10970 New Berlin Road, Jacksonville, FL 32226
Office: (904) 751-7500 ext. 127 **Cell:** (904) 772-4611
Email: justinh@sawcross.com **Website:**
[https://link.edgepilot.com/s/819ec592/58q91IoUw0i5sz8XxlLuBA?](https://link.edgepilot.com/s/819ec592/58q91IoUw0i5sz8XxlLuBA?u=http://www.sawcross.com/)
[u=http://www.sawcross.com/](http://www.sawcross.com/)

AN EMPLOYEE OWNED COMPANY
Contractors & Engineers of Choice for
Building a Better Environment

Sawcross Inc.

Item 4.1 Breakdown/SOV	Total
Mob/Demob	95000
Underground Conduit	100000
Aboveground Conduit	40000
Wire and cable	366000
Electrical Gear	80000
Grounding	21000
Devices	2000
Luminaires	6000
Demolition	50000
Duct Bank	280000
Equipment Connections	20000

1060000

Exclusion Search Results 0 Total Results

Filter by:

Entity Name	Status
"Sawcross, Inc."	Active

Mayor
Rusty Johnson

City Manager
Robert Frank



Commissioners
Scott R. Kennedy, District 1
Rosemary Wilsen, District 2
Richard Firstner, District 3
George Oliver, District 4

April 3, 2024

ADDENDUM NO. ONE (1)
CITY OF OCOEE
ITB #24-008 OCOEE WWTF ELECTRICAL UPGRADE & EXPANSION - REBID

This addendum shall modify and become a part of the original ITB Documents for ITB #24-008. This addendum consists of one hundred fifty-five (155) pages, including all attachments. Bidders should acknowledge receipt of this addendum in the space provided in the Bid Form. Failure to do so may subject the Bidder to disqualification. **The Bid Submission Deadline has changed.**

Answers to questions received and/or Amendments to the ITB Documents are as follows:

Bidders are responsible for reviewing Section 00314 included in Division 0 which provides amendments to the Bidding Documents and answers to questions that were received when this project was previously solicited. Section 00314 must be signed and submitted with Bidder's Bid.

REVISED BID FORM: All Bidders must submit the revised Bid Form attached to this addendum.

Q1. Will the city unload and set the Generator and Blower on the new concrete pads, or should I include rigging and crane to set them in our bid?

A1. Bidders will need to include these costs.

Q2. May we have a bid extension due date of 30 days? This will give us more time to get the prices to a Fair Market Value. The electrical bids are coming in higher the Fair Cost Estimate of \$2.6M. Need time to work through this with the subs to get to a Fair Cost Estimate that works with the budget.

A2. The Bid Submission Deadline has been changed to April 16, 2024 at 2:00 p.m. local time.

Q3. Is General Electric an approved electrical gear manufacturer?

A3. City takes no exception to GE as the gear manufacturer.

Q4. Can it be confirmed that all of the automatic transfer switches will be furnished by the owner?

A4. The ATS for MB1 and MB2 will be furnished by the Owner. All others, ATS # 3 and ATS #4 are under this contract.

Q5. Will the generator house panel be furnished by the owner?

A5. Yes.

Q6. Is lightning protection required for any new or existing structures?

A6. Yes, on the new structures: electrical building and generator housing.

Q7. The specs for the automatic transfer switches say to install (2) two owner-furnished ATS's. The diagram on E06 shows (4) total. If we are to furnish the other two ATS's, can they provide approved manufacturers because there are none listed in the specs?

A7. ASCO, Russelectric.

Q8. On sheet E 17, only 2 of the duct banks show concrete encasement. Are all of the duct banks to be concrete encased, and does it require steel reinforcement?

A8. Yes, all outdoor duct banks are concrete encased, no steel reinforcing required.

Q9. Duct bank schedule for A-A shows MCC-NPW on item 33. Is this the same as the Reuse MCC shown being fed from the new MCC-1?

A9. Yes.

Q10. The duct bank schedule shows Fiber conduits. What size is the fiber conduit supposed to be?

A10. 2" PVC-40.

Q11. Will all the wire splices to existing wire be done in the in-ground pull boxes?

A11. Yes.

Q12. Sheet E13 shows MCC-1A, MCC-1B, and an ATS to be removed and relocated onsite. Is this equipment to be reused and installed with this contract or is it to be stored onsite?

A12. No, will not be reused; the salvaged panels are to be stored on-site.

Q13. Is this an ARPA funded project?

A13. Yes.

Q14. Please provide a detailed list of equipment that will be furnished by the city of Ocoee specifically associated with the blower equipment package and clarify if the VFD's included within the blowers or need to be furnished and installed by the contractor. Also, please clarify all equipment furnished by the city associated with the generator equipment, specifically is all equipment owner furnished including diesel generator, enclosure, access stairs, ATS #1, ATS #2 and generator house panel, fuel tank(s).

- A14. City is furnishing the generator, ATS #1, ATS #2, and blowers, which are to be installed by Contractor. All VFDs are part of the integrator package. See Answer 29 below regarding setting of the secondary transformer furnished and set by Duke.**
- Q15. Is the generator a Ring Power generator and if so, is a day tank required or just belly tank? Will owner fuel tank for initial startup and testing or should contractor include any fuel with their pricing?
- A15. Generator has a belly tank. Owner will not provide fuel for testing. Contractor should include fuel for testing.**
- Q16. What are the anticipated delivery dates of the owner furnished equipment?
- A16. Blowers are onsite. Generator will be delivered in November 2024. ATSs will be delivered in November 2024.**
- Q17. Will the city handle the FDEP permitting for decommissioning the existing generator fuel tank?
- A17. No, Contractor is to handle permit to recommission and remove existing fuel storage tank.**
- Q18. Does the city want to retain the existing generator and if so, does the contractor need to relocate it to another city owned facility?
- A18. No, City does not want to retain the existing generator. Contractor to remove and dispose of existing generator appropriately.**
- Q19. Where the existing asphalt parking spaces are to be demolished and poured back with concrete parking, what is the intent for the repair of the existing asphalt at the joint between the new concrete and existing asphalt? To form and pour the concrete the asphalt will have to be removed an additional +/-8", this will leave a repair detail/joint between the asphalt and concrete. We can either saw cut 12" behind the joint and repair the asphalt or the full area of asphalted can be milled and repaved. Please clarify the intent as the costs will be significantly different between the two means of repair/restoration.
- A19. Saw cut 12" behind the joint and repair the asphalt.**
- Q20. Please confirm the bollards are to be per the detail on C-6 titled "fixed bolt bollard detail" as the bollards on C-4 are labeled as "removable bolt-in bollard". If these bollards are intended to be removed with any regularity, may consider a sleeved bollard detail so that the bollard can be lifted out of the sleeve in lieu of unbolting it from the concrete, which will, over time, crack the concrete and not be able to be replaced after several uses.
- A20. Use fixed bolt bollard details as shown. Bollards are not intended to be regularly removed.**

Q21. Are any expansion joints required on the blower pipe to isolation vibration?

A21. Yes. See blower package discharge accessories on Sheet C-8.

Q22. Is new blower pipe included with the equipment package or should it be provided by the contractor? If so, please clarify the pipe material and if galvanized or stainless steel. Also, please clarify the point of connection and expansion joint should be included at the tie in location.

A22. Discharge accessories included with City provided blower package. Contractor to furnish and install pipe from discharge assembly piping to existing air header using same pipe material, DIP.

Q23. Please clarify if the intent of the contract is to be lump sum or unit price contract. The bid form has unit prices and scheduled quantities. The contract documents and instructions to bidders indicate bids are to be lump sum. The fill and concrete quantities vary from our takeoff quantities so understanding the city's intent as to how the contract will be administered is important to understand prior to bidding. Recommend lump sum for all line items, per plans and specifications, lump sum.

A23. The contract is lump sum with allowance on certain items so if additional material is needed the contractor has a basis for change order based on a unit price.

Q24. Please confirm the contractor is not required to provide an office trailer for owner or engineer on this particular project.

A24. An office trailer for owner or engineer is not required. However, the Contractor shall provide field office and storage sheds that it determines are required for the performance of the Work and protection of materials and equipment.

Q25. Please clarify the concrete parking cross section. Is this concrete to be 6" thick, and is there reinforcement of this slab? What is the intent as to the base material the new concrete at the parking spaces is to be placed over? Is the existing asphalt and base to be removed and built back with new base? If so, please clarify base material, thickness, and concrete design for these parking spaces.

A25. Remove existing asphalt and base then fill and compact subgrade with new base. Concrete shall be at least 3,000 psi concrete and at least 6 inches in thickness and shall utilize 6 x 6 WWF installed on proper benching. Use fiber reinforced concrete mixture conforming to the standards of ASTM C1116. Expansion joints shall be installed at a maximum spacing of 40 feet on center in each direction. Fill subgrade as need with clean fill. Subgrade shall be compacted to a minimum density of 98% of the maximum density as determined by AASHTO T-180.

Q26. Is all sidewalks 6" thick, non-reinforced, per detail shown on C-6?

A26. Yes, per City, all sidewalks 6" thick as utility trucks will typically drive over the sidewalks at times. Concrete shall be at least 3,000 psi concrete and at least 6 inches in

thickness. Use fiber reinforced concrete mixture conforming to the standards of ASTM C1116. Expansion joints shall be installed at a maximum spacing of 40 feet on center in each direction.

- Q27. Please provide details for the new electric building HVAC. Drawing index list a plan sheet H-1 titled Electrical Building HVAC Plan but there is no sheet H-1 in the drawings provided. Also, there is no specification for the HVAC units PAC-1 and PAC-2, please provide more information for pricing of equipment.
- A27. The drawings for this Rebid are located in the project file on Bonfire and include Figure H-1. Bidders are responsible for using the drawings for the rebid.**
- Q28. Is there a preferred instrumentation and controls contractor that is familiar with this plant? There are division 13 specifications but there are no drawings as to the new controls and/or relocation of existing IC equipment. Please clarify the scope of work that the owner requires the contractor to include for division 13 work or confirm I&C will be handled directly by the owner. If scope of work is not documented by plans that can be bid against, recommend owner to establish an allowance line item for Instrumentation & Controls relocation and upgrades to carry in the contract so work can be performed on an as needed basis.
- A28. The I&C and variable frequency drives shall be furnished by Telemetry & Process Controls, Inc. (TPC). Contact Ron Robinette at ron@tlsautomation.com. See attached quote from TPC (3 pages).**
- Q29. Has the city coordinated with Duke for the new electrical transformer and made payment to Duke for engineering and equipment installation?
- A29. Yes, City has coordinated with Duke for payment of engineering and equipment installation. Successful Bidder will be provided contact information for electrical contractor to coordinate setting of transformer on concrete pad with conduit to the new electrical building.**
- Q30. On sheet E 17 only two of the duct banks specifically call for concrete encasement, please confirm if only AA and FF are to be concrete encased, or if all are to be concrete encased. Also, please clarify if any steel reinforcement is necessary for the concrete encasement detail.
- A30. All yard duct banks shall be concrete encased with no steel reinforcement.**
- Q31. There are 4 ATS shown on E06, please clarify if the city is furnishing all 4 or if 2 ATS are existing to be relocated or if the electrical contractor is to provide 2 new ATS? If contractor is to provide any of the ATS, please provide specifications and approved manufacturers.
- A31. The City is furnishing the two (2) 1600A 4p ATS. The two (2) 125A ATS shall be furnished by the contractor.**
- Q32. There is a specification for lighting protection, however the electrical drawings only indicate a grounding for the new electrical building. Please clarify if a new lighting protection system is required for the new electrical building or any other location of the site?

A32. Yes Section 16601, for the new electrical building and new generator enclosure.

Q33. Duct bank schedule for A-A shows MCC-NPW on item 33. Is this the same as the Reuse MCC shown being fed from the new MCC-1?

A33. The MCC-NPW item # 33 is the 400A feeder to the “REUSE MCC” shown on sheet E07.

Q34. The duct bank schedule shows Fiber conduits. What size is the fiber conduit supposed to be?

A34. 2” PVC-40.

Q35. Will all the wire splices to existing wire be done in the in-ground pull boxes?

A35. Yes.

Q36. Sheet E13 shows MCC-1A, MCC-1B, and an ATS to be removed and relocated onsite. Is this equipment to be reused and installed with this contract or is it to be stored onsite?

A36. No, the salvaged panels are to be stored on-site.

Q37. Can all PVC conduits encased in concrete and below concrete slab be Sch 40 in lieu of Sch 80?

A37. Yes.

Q38. Whose scope is it for the setting of the (2) Blowers cabinets?

A38. Contractor to set City furnished blower cabinets.

Q39. The lighting fixture in the electrical room calls for 4’ fixture but the Dwg. E14 shows a longer fixture. Please clarify.

A39. 4 Feet.

Q40. How long is the load bank testing for the generator, so we can estimate the fuel consumption?

A40. Per Spec 16216, 4 hours.

Q41. Who will be providing the pad for the new generator?

A41. Contractor. See also Answer #29.

Q42. Who will be providing, if any the fiber cable? Need scope.

A42. Contractor, See Section 13060.

Q43. Who will provide and install the generator exhaust and silencer?

A43. City to provide generator exhaust and silencer and contractor to install.

Q44. Are all the conduits leaving the concrete ground vault encased in concrete? (We must dig up conduits and redirect them, and I wanted to verify that we needed to chip the concrete to do so.)

A44. Unknown as this time.

Q45. Are all the generator stairs and components provided by the city?

A45. Yes. See attached generator quote (7 pages).

Q46. Who is responsible for supplying fuel for the generator?

A46. Contractor to supply fuel.

Q47. Does the roof and attached I beams need to be completely demoed underneath the existing generator? The drawings show removing the block wall but does not clarify on the roof.

A47. Yes, remove attached I beams.

Q48. Who is responsible for covering the Duke fees in relocating the new transformer and removal of the old?

A48. City has coordinated with Duke for payment of engineering and equipment installation. Successful bidder will be provided contact information for electrical contractor to coordinate setting of transformer on concrete pad with conduit to the new electrical building and removal of old.

Q49. Who is responsible for the new blowers start up?

A49. Contractor.

Q50. Will the city be responsible for removal of the old generator?

A50. No, City does not want to retain the existing generator. Contractor to remove and dispose of existing generator appropriately.

Q51. Will the city be responsible for transporting the old equipment that is to be demoed?

A51. Contractor to remove and dispose of old equipment appropriately.

Q52. Will there be a place to store the equipment that is being removed, on site?

A52. Yes, Contractor to provide a site utilization plan which will include an area to place the old equipment to be removed.

Q53. Please provide submittal/installation information for the owner furnished BLOWERS.

- A53. **See attached manufacturer brochure for blowers (8 pages). City contacted UBI and was informed that there are no blower installation drawings.**
- Q54. Please provide submittal/installation information for the owner furnished GENERATOR.
- A54. **See attached Submittal Data for generator (116 pages).**
- Q55. Please provide piping specifications for BLOWER connections.
- A55. **New blower piping is to be Ductile Iron like the existing - Bare interior pipe, no liner. this is an open-ended pipe to diffusers; extreme PSI concerns should not be a problem.**
- Q56. Is it possible to extend the bid date?
- A56. **See Answer #2.**
- Q57. Is it possible to extend the question period?
- A57. **The deadline for receipt of questions remains the same.**
- Q58. REF: Bid Form: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion – Rebid, Item 4.2 Furnish and Integrate SCADA (Allowance) and Ocoee WWTF Electrical Upgrade and Expansion COMBINED Technical Specifications-1, 13600 PROCESS CONTROL SYSTEM GENERAL PROVISIONS, 1.03.A.1.h.i. Smart Energy Solutions. Is the allowance indicated in bid item 4.2 covering all of the Process Control System Supplier’s scope of work as described and indicated in SPECIFICATIONS DIVISION 13? What portions of this scope of work are not included?
- A58. **Yes. Additionally, the PICS Supplier referenced in Section 13600 1.03A(1)(i) is amended to Telemetry Process Controls, Oakdale, MN, (651) 430-0435. Per Spec 13600 Contractor is to provide a list of currently-known requests for interpretations of which CONTRACTOR, and PICS Supplier are currently aware and then provide a list of proposed exceptions to the Contract Documents along with brief explanation of each.**
- Q59. REF: Bid Form: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion – Rebid, Item 4.1 Electrical Equipment (Not Including 4.11, 4.12, 4.13, 4.14, 4.15). Does this line item include all labor and materials to install items 4.11, 4.12, 4.13, 4.14, 4.15? Does this line item include contractor’s portion of conduit/cabling/conductors associated with the Process Control System?
- A59. **Yes, item 4.1 is to include all installation costs associated with the equipment listed in 4.11, 4.12, 4.13, 4.14 and 4.15. See Spec 13060.**
- Q60. REF: Bid Form: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion – Rebid, Item 4.13 Electrical Equipment: Equipment Purchase Only: ATS(Spec Section 16250) and Ocoee WWTF Electrical Upgrade and Expansion COMBINED Technical Specifications-1, Section 16250.1.01.A scope of Work: Install two (2) Owner furnished automatic transfer switch including all appurtenances required as shown on the Drawing and specified herein. Are the

ATS to be owner furnished? If so why is there a line item on the bid form for Equipment Purchase of the ATS?

A60. This project includes four (4) automatic transfer switches, two (2) related to MB-1 and MB-2 are furnished by the owner and to be installed by the contractor. The other two (2), ATS-3 and ATS-4 are furnished, installed, and tested by the contractor.

Q61. REF: Ocoee WWTF Electrical Upgrade and Expansion - BID SET 03-11-24, Sheet E15, SHEET NOTES 15 AND 16 AT SLUDGE BLOWER VFDS. Are Sheet Notes 15 and 16 at the SLUDGE BLOWER VFD correct? These notes are applicable to SMOKE DETECTORS. Sheet Notes 9-14 are labeling the other VFDs for DR ROTORS 1 thru 6.

A61. Change sheet notes on E15 over sludge blower VFDS from 15 and 16 to 18.

Q62. REF: Bid Form: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion – Rebid and Ocoee WWTF Electrical Upgrade and Expansion COMBINED Technical Specifications-1, Section 16370 VARIABLE SPEED DRIVES 1.01.A. SCOPE OF WORK Furnish and install variable speed drives including all appurtenances required as shown on the drawing and specified herein. Is the contractor to provide all eight (8) VFD's? Will the owner furnished BLOWERS include VFDs or is the contractor to provide? There is no line item for EQUIPMENT PURCHASE of VFDs on the Bid Form.

A62. Owner will provide all the drives on this project. The mounting, installation and wiring effort is under this contract.

Shannon Hopper

Shannon Hopper
Purchasing Technician

cc: Jamie Croteau, Utilities Director

Attachments: Bid Form – Revision 01 (12 pages)
Telemetry & Process Controls – quote (3 pages)
Ring Power – Generator quote (7 pages)
United Blower, Inc. – Manufacturer brochure (8 pages)
Ring Power – Submittal Data (116 pages)

SECTION 00300

BID FORM - REVISION 01

SUBMITTED: _____
(Date)

PROJECT IDENTIFICATION: CITY OF OCOEE ITB #24-008
Ocoee WWTF Electrical Upgrade and Expansion - Rebid

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____ PHONE NO.: _____
CITY, STATE, ZIP: _____

CONTRACTOR'S FEDERAL I.D. NUMBER _____

CONTRACTOR'S FLORIDA LICENSE NO.: _____

THIS BID IS SUBMITTED TO: City of Ocoee, Florida (hereinafter called Owner)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to perform and furnish all Work, as specified or indicated in the Contract Documents for the Contract Price and within the Contract Times indicated in this Bid Form and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Bidding Documents, including, without limitation, those dealing with the disposition of Bid Bond. This Bid will remain open for ninety (90) calendar days after the day of Bid opening. Bidder will sign and deliver the required number of counterparts of the Amendment to the Agreement with the Bonds and other documents required by the Bidding Requirements within ten (10) days after the date of Owner's Notice of Intent to Award.
3. In submitting this Bid, Bidder makes all representations required by the Instructions to Bidders and the Agreement and further warrants and represents that:
 - a. Bidder has examined copies of all the Bidding Documents and of the following Addenda:

No. _____	Dated _____	No. _____	Dated: _____
No. _____	Dated _____	No. _____	Dated: _____
No. _____	Dated _____	No. _____	Dated: _____
No. _____	Dated _____	No. _____	Dated: _____

(Receipt of all which is hereby acknowledged) and also copies of the Invitation to Bid and the Instructions to Bidders.

- b. Bidder has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing the Work.
- c. Bidder has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface of subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions, as provided in paragraph 4.02.1 of the General Conditions. Bidder accepts the determination set forth in paragraph SC-4.02 of the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which Bidder is entitled to rely, as provided in paragraph 4.02 of the General Conditions. Bidder acknowledges that such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site.
- d. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work, or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.
- e. Bidder understands the full extent and scope of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted.
- f. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and date with the Contract Documents.
- g. Bidder has given Engineer written notice of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

- h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a farce or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
- i. Bidder hereby agrees to commence Work under this contract on the date to be specified in the Notice to Proceed and to fully complete all work of the project within the Contract Time specified in the Contract for Construction (Section 00500). Bidder further accepts the provisions of the Contract for Construction as to liquidated damages and agrees to pay as liquidated damages the amount stated in the Contract for Construction (Section 00500), for each consecutive calendar day completion of the Work is delayed.

Completion Schedule:

- 1) The Work shall be Substantially Complete within the Contract Time specified in Article 3.1 of the Contract for Construction (Section 00500).
 - 2) The Work shall be finally complete within the Contract Time specified in Article 3.1 of the Contract for Construction (Section 00500).
4. All bid items shall include all materials, equipment, labor, permit fees, taxes, tests, miscellaneous costs of all types, overhead, and profit for the item to be complete, in place, and ready for operation in the manner contemplated by the Contract Documents. Bidder submits the **TOTAL BID OR TOTAL BASE BID** to perform all the Work, as required by the Drawings and Specifications.
5. The following documents are made a condition of this Bid:
- a. **Bidding Documents and shall include the following:**
 - 1. Bid Forms (entire Section 00300, 00301, 00301A, 00302, 00303, 00310, 00311, 00312, 00313, and 00314)
 - 2. Bid Bond (Surety Bond or Cashier's Check) (Section 00410)
 - 3. Non-collusion Affidavit (Section 00480)
 - 4. Conflict of Interest Disclosure Form (Section 00480A)
 - 5. Certification of Non-segregated Facilities (Section 00481)
 - 6. Sworn Statement on Public Entity Crimes (Section 00482)
 - 7. Certification of Nondiscriminatory Labor Practices (Section 00483)
 - 8. Certification Regarding Scrutinized Companies' Lists (Section 00484)

(Remainder of page intentionally left blank)

Bid Form - Revision 01: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid

Item No:	Description	Units	Contract Quantity	Unit Price (in Numbers)	Total Price (in Numbers)
1	Mobilization, Bonds, and General Conditions				
1.1	Mobilization/ Demobilization	Lump Sum	1.00		
1.2	General Conditions	Lump Sum	1.00		
1.3	Utility Locates	Lump Sum	1.00		
1.4	Erosion Control	Lump Sum	1.00		
1.5	Construction Photographs and Audio - Visual Recording	Lump Sum	1.00		
1.6	Survey (Horizontal and Vertical Controls & As-Builts)	Lump Sum	1.00		
2	Site Work				
2.1	Demolition	Lump Sum	1.00		
2.2	Fill	Cubic Yards	250.00		
2.3	Grading	Lump Sum	1.00		
2.4	Concrete Sidewalk and Pads	Cubic Yards	75.00		
2.5	Sod	Square Yards	500.00		
2.6	Concrete Parking	Cubic Yards	35.00		
2.7	Bollards	Each	13.00		
2.8	Install (2) Blowers (Blowers Purchased by City of Ocoee)	Lump Sum	1.00		
3	Building				
3.1	Electrical Building	Lump Sum	1.00		
3.2	Electrical Building HVAC	Lump Sum	1.00		
4	Electrical System and Instrumentation Control				
4.1	Electrical Equipment (Not Including purchase only costs for 4.11, 4.12, 4.13, 4.14, 4.15) and including installation costs for 4.1, 4.11,4.12,4.13,4.14, 4.15	Lump Sum	1.00		
4.11	Equipment Purchase Only: Motor Control Centers (Spec Section 16921)	Lump Sum	1.00		
4.12	Equipment Purchase Only: Switchboard (Spec Section 16940)	Lump Sum	1.00		
4.13	Equipment Purchase Only: ATS (Spec Section 16250)	Lump Sum	1.00		
4.14	Equipment Purchase Only: Panelboards (Spec Section 16160)	Lump Sum	1.00		
4.15	Equipment Purchase Only: MB1 & MB2 (Elect Drawing)	Lump Sum	1.00		
4.2	Furnish and Integrate SCADA (Allowance)	Lump Sum	1.00	486,502.00	486,502.00
4.3	Install 1000 kW Generator (Generator Purchased by City of Ocoee)	Lump Sum	1.00		
				Total Base Bid	
Written Total Base Bid:					

COMPANY NAME: _____

BID PREPARED BY (PRINT): _____

SIGNATURE: _____

7. The Bidder acknowledges that the City specifically reserves the right to accept and make an award to a Bidder that has not submitted the lowest Bid when, in Owner's sole and absolute discretion, it determines that action to be in its best interest. The terms used in this Invitation to Bid, which are defined in the General Conditions and included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.
8. The work shall be performed under a Florida General Contractor license. Contract shall not be awarded unless proof of valid license(s) is provided.
9. It is understood that where quantities for unit price work have been presented on the Bid Form, they are approximate only and are solely for the purpose of facilitating the comparison of bids, and that the Contractor's compensation will be computed upon the basis, described in the measurement and payment clauses in the specifications contained herein.
10. **BASE BID - SCHEDULE OF MANUFACTURERS/SUPPLIERS**

If the foregoing Schedule of Bid Items is presented in a Base Bid format, the undersigned as Bidder, agrees that the Contract, if awarded, will be on the basis of the materials and equipment named in the Contract Documents, in accordance with Article 10 of the Instructions to Bidders (Section 00100). The undersigned, as Bidder, also agrees that the Total Bid reflects the equipment and material supplied by one of the manufacturers/suppliers listed in the City's Approved Materials List. If the Bidder desires to propose an alternate manufacturer/supplier, he may write in the name of such alternate in the substitution list included within this Bid Form, but he must, nevertheless, also choose an approved manufacturer/supplier. If the proposed alternate manufacturer/supplier is determined "not equivalent" by the Engineer, the Bidder must furnish equipment and/or material items by the Bidder's chosen approved manufacturer/supplier. If the Bidder fails to indicate which listed manufacturer/supplier he intends to use if an alternate is rejected, he must use the manufacturer/supplier chosen by the City. Also, if the Bidder chooses more than one approved manufacturer/supplier, he must use the first manufacturer/supplier written in the schedule of Base/Alternative Bid Manufactures/Suppliers table within this Bid Form (unless an alternate is approved).

11. **SUBSTITUTIONS AND "OR EQUAL"**

The undersigned as Bidder agrees that substitutions, or "equal," items will not be considered until after the effective date of the Agreement and will be evaluated in accordance with paragraphs 6.05.1 and 6.05.2 of the General Conditions. In addition to the reimbursement required under the General Conditions, the Contractor shall also reimburse the Owner for any engineering costs directly attributable to the change in manufacturers/suppliers caused by the acceptance of proposed alternates, such as, additional field trips for the Engineer, additional redesign costs, additional review costs, etc. Other costs directly attributable to the change in manufacturers/suppliers caused by the acceptance of proposed alternates, such as; increased electrical requirements, larger building, additional pumps or tankage, etc., shall be borne by others and not the Owner. If

Bidder intends to propose substitutions or "equal" items after the effective date of the Agreement, it is agreed that these items must be listed on the Substitution List included within this Bid Form, with a deductive amount representing 50 percent of the total savings between the named Base Bid/Alternative Bid item and the proposed item. "Base Bid/Alternative Bid" item substitutions providing to the Owner equipment or material cost savings of less than \$1,000 will not be considered. The undersigned, as Bidder, also agrees that if a substitution or "equal" item is not listed on the Substitution List included with the Bid, all of the savings between the named item and the proposed item will go to the Owner, if the Owner accepts the proposed item in accordance with paragraphs 6.05.1 and 6.05.2 of the General Conditions. The Owner may request, and the undersigned Bidder shall supply, complete information on proposed substitutions. Such information shall be the manufacturer's current published or preprinted information for the specific substitution.

12. As Bidder, I hereby certify that I am aware and understand that the City of Ocoee in its sole discretion reserves the right to waive technicalities or irregularities, to reject any or all Bids, and/or to accept that Bid which is in the best interest of the City. The award of this Bid, if made, may be based on considerations other than total cost, and may be awarded based on various considerations, including but not limited to: Bidder experience and whether the Bid, in the judgment of the City, is the most responsive to the City's needs.

(Remainder of page intentionally left blank)

SUBSTITUTION LIST			
Bidder offers the following substitutions and "equal" items.			
Equipment Item or Material	Spec Section	Alternative Manufacturer/Supplier (List One Only)	Deductible Amount* (Indicate Whether Lump Sum or Unit Price)
Represents 50 percent of the difference in cost in accordance with the General Conditions (Minimum Deductible Amount per Substitution Item shall be \$1,000) (Bidder may make additional copies of this page as required.)			

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

SOLE PROPRIETORSHIP

(SEAL)

(Individual's Signature)

(Individual's Name)

doing business as

Business Address:

Phone No.:

Florida License No.: _____

A PARTNERSHIP

(SEAL)

(Partnership Name)

(General Partner's Signature)

(General Partner's Name)

Business address:

Phone No.:

Florida License No.: _____

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

A CORPORATION

(Corporation Name)

(State of Incorporation)

By

(Name of person authorized to sign)

(Title)

(Authorized Signature)

(Corporate Seal)

Attest

(Secretary)

Business address:

Phone No.:

Corporation President:

Florida License No.:

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

A JOINT VENTURE

By

(Name)

(Address)

By

(Name)

(Address)

Business Address:

Phone No.:

Florida License No.:

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Florida License No.:

13. List the following in connection with the Surety which is providing the Bid Bond:

Surety's Name: _____

Surety's Address: _____

14. Name and address of Surety's resident agent for service of process in Florida:

(Remainder of page intentionally left blank.)

CORPORATE AUTHORITY TO EXECUTE DOCUMENTS

I HEREBY CERTIFY that a meeting of the Board of Directors of _____, a corporation under
(Contractor's Corporate Name)
the laws of the State of _____, held on the _____ day of _____, 20____,
the following resolution was duly passed and adopted:

"RESOLVED, that _____
(signature of individual) (typed name of individual)
as _____ of the corporation, is hereby authorized to execute and all
documents required to be signed by an officer of the Corporation in order to submit a valid bid,
contract and bond for

CITY OF OCOEE
Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

between the CITY OF OCOEE, a municipal corporation, and this corporation, and that his
execution thereof, attested by the Secretary of the corporation and with corporate seal affixed shall
be the official act and deed of this corporation."

I FURTHER CERTIFY that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the
corporation this _____ day of _____, 202____.
(CORPORATE SEAL)

(Corporate Secretary)

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____, 20____
by _____
(name of officer or agent, title of officer or agent), by means of ☐ physical presence or ☐ online
notarization, of _____ (name of corporation acknowledging), a
_____ (state or place of incorporation) corporation, on behalf of the
corporation. He/She is personally known to me or has produced _____ (type
of identification) as identification and did/did not take an oath.

(Notary Public)
My Commission Expires: _____

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00300-12



October 27, 2023

**City of Ocoee, FL
Wastewater Treatment Plant**

Listed below please find TPC's bill of materials, list of services and pricing for the equipment we are quoting based on the plans and specifications.

- **PLC Control Panel (PLC-E1) 120 Vac 1 phase**
 - Nema type 12 free standing enclosure with side panel and back panel
 - Enclosure fans with filters
 - Incoming power main circuit breaker, 120 Vac, 1 phase
 - Incoming power lightning arrestor, 120 Vac, 1 phase
 - Fiber converter/ Ethernet switch
 - UPS 1000 VA
 - UPS receptacle
 - Convenience receptacle
 - PLC rack, Allen Bradley ControlLogix
 - PLC power supply, Allen Bradley ControlLogix
 - PLC processor, Allen Bradley ControlLogix
 - PLC I/O cards, Allen Bradley ControlLogix
 - MODBUS communication module
 - Operator interface, Maple Systems 15" color touchscreen
 - 24 Vdc power supply
 - Enclosure corrosion inhibitors
 - (2) Fiber optic patch panel
 - (2) Fiber optic patch cable
 - (AR) Time delay relays
 - (AR) Control relays
 - (AR) Fuse holders and terminals
 - Surge arrestors for digital and analog inputs
 - Enclosure corrosion inhibitors
 - Misc. panel components, nameplates, wire duct, terminals, etc.
 - UL 508A listed
- **VFD Control Panel 460 Vac 3 phase 75 HP , 65K AIC Rated (Quantity 8)**
DR-1 through 6, SB-1 and 2
 - Nema type 12 free standing enclosure with side panel and back panel
 - Incoming power surge arrestor
 - Circuit breaker with disconnect operator
 - Cooling fans/filters thermostatically controlled
 - Variable frequency drive, sized for 75HP (60HP severe duty) 480 Vac 3 phase, Danfoss with integral variable frequency drive fuses
 - Variable frequency drive ethernet/ip communication module
 - Variable frequency drive operator interface module
 - Line reactor, 5%
 - DV/DT filter
 - Control power transformer with primary/secondary fuses, 1KVA
 - Control power surge arrestor
 - Control power circuit breaker, 120 Vac, 1 phase
 - Pilot Light, VFD Running
 - Pilot Light, VFD Fault

- (AR) Time delay relays
- (AR) Control relays
- (AR) Fuse holders and terminals
- UL label
- **Field/Spare Parts**
 - (1) Complete PLC
 - Relays, 5 each type
 - (1) Power supply
 - (96) Corrosion inhibitor
 - (1) Selector switch, 2 position, On-Off
 - Fuse, 12 each type
 - 120VAC surge arrestor
 - Digital signal surge protector, 20%
 - (3) Analog signal surge arrestor
- **Local VFD Control Panel (Quantity 4)**
 - Nema type 4X 316 SS enclosure with and back panel
 - Selector switch, 2 position, On-Off
 - Misc. panel components, nameplates, wire duct, terminals, etc., if required
- **Modifications to the existing VT SCADA HMI**
 - 1 Lot programming services
- **Startup, Commissioning and Training**
 - 1 Lot Field services for startup, commissioning, and training

TPC's price for items listed above is: \$ 486,502.00

TPC's price includes:

- Engineering
- Submittals Operation & Maintenance Manuals
- PLC/HMI programming
- Start-up and training
- 1-Year Warranty
- Factory Check Out
- Freight to US destination

TPC's price does not include:

- Fields instruments
- Taxes

Terms and Conditions

ACCEPTANCE: This proposal is an invitation for an offer and will become a binding contract when accepted.

LIMITATION OF PROPOSAL: The prices and terms quoted in this proposal are subject to acceptance by the Purchaser within a period of (30) calendar days from the date herein.

EXCLUSIONS: This proposal is based solely and completely on specifications submitted to Telemetry and Process Controls, Inc. (TPC) at the time of the writing of the proposal. General plans and specification not actually submitted shall not apply. This proposal, together with all annexed specifications, when accepted, shall be the complete agreement between the parties; and any alternations or unusual and undisclosed conditions or deviations from the above specifications involving extra costs shall be agreed upon in writing by both parties and shall become an additional charge over and above the proposal price set forth herein. Delays or impossibility of performance by TPC because of strikes, accidents, or other reasons beyond the control of TPC shall relieve us from all liability herein.

SHIPMENT: Time of shipment shall be as stated in the proposal after receipt of order and acceptance and final approval of all drawings and submittal.

TERMS OF PAYMENT: Terms are Net 30 days, based on rated credit. Otherwise, alternate arrangements must be made. These terms and conditions have control over any terms presented by Buyer, through a purchase order or otherwise.

We reserve the right to cancel the contract or cease work if payments thereon are not received when due. 1.5% per month shall be charged on all unpaid balances.

TAXES: The Purchaser shall pay any local, state or federal sales, excise or use tax imposed on the equipment in addition to the prices quoted.

WARRANTY LIMITATION: There are no warranties that extend beyond the warranties herein after expressed.

WARRANTIES: All work shall be done in a workmanlike manner according to standard practices. We warrant performance against defects in materials and workmanship for a period of twelve (12) months from the date of shipment from TPC. We agree to pass on to the Purchaser such warranties, if any, as may be extended by the manufacturer for material supplied. Labor for replacing defective materials shall not be provided by us unless it is specifically spelled out in the proposal. We shall not be responsible for materials damaged, lost or stolen after delivery, through no fault of ours, or for failure to deliver and perform because of reasons beyond our control.

EXCLUSIVE REMEDIES: Remedies are limited to the repair or replacement at FOB point of delivery. Consequential damages are excluded. In no event shall TPC be responsible for consequential damages of any such defective material or workmanship including, but not limited to, the Purchaser's loss of material or profits, increased expenses of operation, downtime or reconstruction of the work, and in no event shall TPC's obligation under this warranty exceed the original contract price of the defective item. It is agreed that any action for breach of express or implied warranty shall be initiated within fifteen (18) months of the date of shipment by TPC and only those defects that are documented to have occurred within twelve (12) months from the date of the equipment's start-up and acceptance or (18) eighteen months from the date of TPC's shipment will be covered by the warranty.

DISCLAIMER: TPC will not be responsible for damage to equipment or materials through improper installation, storage, improper services, or through attempts to operate it in excess of its rated capacity or recommended use, intentional or otherwise, by parties other than TPC or its authorized representatives.

CONDITIONS OF SALE: Prices quoted are those now in effect. Seller reserves the right to bill at the prices in effect at the time of shipment if the proposal is not accepted in writing within thirty (30) days, unless a longer term of validity is in writing on the proposal.

LIMITATIONS OF LIABILITY

A. Neither Seller nor its suppliers of any tier will be liable to Purchaser, whether in contract, in tort (including negligence and strict liability), under any warranty or otherwise, for any special, indirect, incidental, or consequential loss or damage whatsoever, or for loss of or to the plant, loss of use of equipment or power system, cost of capital, loss of profits or revenue or the loss of use thereof, cost of environmental damage or clean-up, or claims of customers of Purchaser. The remedies set forth herein are exclusive, and the total cumulative liability of seller and its suppliers under any purchase order or any act or omission in connection therewith or related thereto, whether in contract, in tort (including negligence and strict liability), under any warranty, or otherwise, will be limited to the price of the contract.

B. The provisions of this Article shall survive termination, cancellation or expiration of the purchase order and shall apply, notwithstanding any other provisions of this Agreement or any related document thereto, to the fullest extent permitted by law. Prior to the transfer of any equipment or material furnished or for which work is furnished hereunder from the project site (except temporarily for repair work or permanently for disposal), or the transfer of any interest therein or in the plant, Purchaser shall obtain for Seller written assurances from the transferee of limitation of and protection against liability following the proposed transfer at least equivalent to that afforded seller and its suppliers under the purchase order.

Your North and Central Florida Caterpillar Dealer

ST. AUGUSTINE
500 World Commerce Prkwy
St. Augustine, FL 32092
904-737-7730

TALLAHASSEE
4752 Capital Circle NW
Tallahassee, FL 32303
850-562-1622

OCALA
6202 N US 301/441
Ocala, FL 34475
352-732-4600

ORLANDO
9901 Ringhaver Dr.
Orlando, FL 32824
407-855-6195

TAMPA
9797 Gibsonton Dr
Riverview, FL 33569
813-671-3700

SALES

SERVICE

PARTS

LEASING

RENTALS

QUOTATION / SALES AGREEMENT / SECURITY AGREEMENT

DATE: 7/13/2023

QUOTATION NO: MB23-073

CUSTOMER NAME: City of Ocoee

ADDRESS:

CITY/STATE/ZIP: , FL

CONTACT: Bruce Chiesa

PHONE:

ESTIMATED SHIPPING LEAD TIME: 30-70+
weeks- changes weekly or depending on stock

SHIPPING VIA/FOB:

ESTIMATED SUBMITTAL LEAD TIME: 6 Weeks

JOBSITE ADDRESS:

CITY/STATE/ZIP: FL

PROJECT NAME: Ocoee WTP

TERMS: Full payment is due from buyer within 10 days of delivery or pickup of the equipment.

DESCRIPTION OF MATERIAL	UNIT PRICE	EXTENSION
Please ensure quote meets your expectations.		
For your reference, your Sourcewell Member ID is 75029		
One (1) New Caterpillar Diesel Generator – Model V12 Rated 1000 KW standby at 0.8 PF, 480 Volts, 3 Phase, 4 Wire, 60 Hz at 1800 RPM, with following options:		

Quotation Accepted By: _____ Date: _____ Tax No.: _____

Customer: _____ Salesman's Signature: **Mark Barbarulo**

Mark Barbarulo, EPG Sales. Central Florida

TERMS

- ***This quotation is valid for 30 days. Due to the fluctuating costs associated with key materials such as steel, aluminum, and copper, and other manufacturer delays beyond Ring Power's control, we reserve the right to review quotation pricing at the time of order and again at time of equipment release. If material costs increase by greater than 2%, Ring Power will update our quotation accordingly. We appreciate your understanding during this volatile time and look forward to partnering with you as we work through it together.***
- All quoted prices are subject to change without notice. Those in effect on the date of shipment shall prevail.
- Subject to credit approval.
- Used equipment is subject to prior sale.
- A 25% restocking fee will be assessed for all canceled orders or returned materials.
- No retainage to be withheld. Ring Power Systems is an equipment supplier and is not a sub-contractor. Our terms are Net 10 days.
- No sales tax is included.
- Buyer grants to seller a security interest in all equipment as described in this agreement until such time as payment is made in full in accordance with the terms and conditions of this agreement and in accord with the seller's credit application.
- Ring Power requires a purchase order to secure this sales agreement.

DESCRIPTION OF MATERIAL	UNIT PRICE	EXTENSION
• Main UL circuit breaker 1600amp • CAT EMCP Control panel with safety shutdowns, Engine controls and gauges • Voltage regulator • Governor • PMG excitation • Jacket water heater • Battery charger UL 10 amp • 2 Year / 1000 hour Caterpillar limited warranty • Start up and Commissioning • Includes 4 hour load test • Batteries and cables • Introduction and training to personnel • Freight to customer site - 5000 gallon double wall tank * 4595 gallons usable fuel (when tank is filled to 90%) * 63 hours of usable fuel at 100% load Construction: - 5000 gallons - U.L. 142 listed generator sub-base tank * FDEP: EQ625 - 0.1875" thick steel primary tank & 0.1875" thick steel secondary tank - Tank interior epoxy coated for rust prevention - Neoprene mounting pads for under tank supports included - Tank ships with vacuum in interstitial for on-site integrity verification Atmospheric & Emergency vents: - 3" atmospheric vent - 8" primary tank and 8" secondary tank emergency vents Fuel level & leak switches: - High, Low, fuel level & interstitial leak switches * Wired to genset control panel for alarms - Mechanical fuel level gauge, visible from fuel fill Internal conduit stub-up area (through tank): Exterior fill with spill containment Pneumercator TMS-2000 - Audible alarm with silence, and visual alarm indication - NEMA 4X enclosure		

DESCRIPTION OF MATERIAL	UNIT PRICE	EXTENSION
- 4 Relay / 4 Input I/O card - Magnetostrictive probe (fuel level probe) with float and install kits Includes 2 probes and 8 leak/point level sensor inputs, 2 programmable relay outputs and contact closure inputs - Aluminum construction - 42" tall handrails - Four (4) stair sets with 36" X 42" platform Construction: - Weatherprotective, sound attenuated, aluminum enclosure * Walk-in design - Pre-finished aluminum modular panel design - Color: selected by owner (paint chip needed to match) - PE certified to 150 MPH wind load * Designed to meet and/or exceed to load combination requirements in ASCE 7-16 Sound Attenuation: - Sound attenuated - 25 dB(A) reduction at 7 meters - 2" fiberglass acoustic insulation - Perforated aluminum interior liner on ceiling and discharge hood Airflow through enclosure: - Intake: * Hooded intake with bird / rodent screen - Discharge: * Hooded discharge with gravity dampers and bird / rodent screen - Designed to minimize water penetration into enclosure during heavy rainfall Enclosure entrances: - Stainless steel, padlockable handles and aluminum continuous piano hinges - Four (4) single access doors - Reinforced door framing - Door drip guards - Four doors with panic pushbar exit devices Exhaust and Fluids: - Exterior stainless steel critical grade silencer - Exterior muffler mounting hardware - Stainless steel exhaust flex with heat resistant exhaust blankets - Exhaust elbow and rain cap - Exhaust rain shield - Pre-fit and ship loose muffler and flex - Fumes disposals & engine drains piped to outside of enclosure		

DESCRIPTION OF MATERIAL	UNIT PRICE	EXTENSION
Electrical Package: - 10kVA, 480/120 208V 3 phase Mini Power Zone, NEMA 4X and surge protection - Qty (3) LED light fixtures - Qty (2) light switches - Qty (2) 20A GFI duplex receptacles - Qty (3) DC powered lights with one hour timer - Exit signs 300 Series, Automatic Delayed Transition Transfer Switch 1600 amp N12		
Total NET for above		\$526,465.00

Exceptions & Clarifications:

2.08.B- Enclosure shall be constructed in .080" aluminum in lieu of .125"

*Proposal per Specs 16250. NO Drawings provided.

*ASCO is providing Contactor Type transfer switch in lieu of Breaker Type Transfer switch

NOTE:

*******DUE TO THE VOLATILITY OF THE MATERIALS MARKET, ALL PROJECTS WILL BE RE-PRICED AT TIME OF RELEASE TO PRODUCTION. ANY INCREASE OR DECREASE WILL BE ASSESSED AND APPLIED AT THAT TIME. BASED ON RECENT MATERIAL COSTING, ESTIMATED PRICING ESCALATION IS 10% INCREASE PER MONTH ON ENCLOSURES, TANKS AND GENERATORS.*******

Notice to Buyer:

The Seller shall not be responsible for any failure to perform, or delay in performance of, its obligations resulting from or associated with the COVID-19 pandemic or any future epidemic, and the Buyer shall not be entitled to any

DESCRIPTION OF MATERIAL	UNIT PRICE	EXTENSION
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damages including but not limited to liquidated, special, consequential, or punitive, resulting thereof. Furthermore, the Seller’s product lead times are based upon the information provided to Seller from its suppliers at the time of quotation. The Buyer accepts that lead times for products can change and do so without notice and due to reasons, that are beyond any control of the Seller. As such, the Seller shall not be responsible for any failure to perform, or delay in performance of, its obligations resulting from lead times that extend past those originally quoted, and Buyer shall not be entitled to any damages resulting thereof."

This is not part of the above project, this is an ADDER for Standard Service agreement- Budget only, A site visit will be needed to firm up pricing. No load bank included. Please contact below for firm pricing.

Vicky Gallagher |Product Support Service Representative (PSSR)|
 Power Systems Division | **Ring Power Corporation** | 9901
 Ringhaver Drive |Orlando, Florida 32824 | Cell: 407-466-8450 |
 victoria.gallagher@ringpower.com

SIZE	Annual Maintenance with T/A
KW	
5 - 25 *	\$ 720.21
26 - 50 *	\$ 720.76
51 - 100 *	\$ 788.62
101 - 150	\$

Updated Pricing Effective 6/1

771.15
771.24
845.67
913.71

DESCRIPTION OF MATERIAL		UNIT PRICE	EXTENSION
	852.66		
151 - 200	\$ 1,112.09		1194.68
201 - 300	\$ 1,446.94		1562.82
301 - 400	\$ 1,557.52		1696.09
401 - 500	\$ 1,876.75		2041.94
501 - 750	\$ 2,219.76		2420.18
751 - 1000 **	\$ 3,783.11		4114.96
1001 - 1500 **	\$ 4,357.32		4802.06
1501 - 2000 **	\$ 5,200.60		5763.12
2001 - 2500 **	\$ 5,652.89		6284.27
C175-16 **	\$ 6,136.20		6762.09
C175-20 **	\$ 7,199.36		7937.48

5 - 25 * 685.92485

Standard Prices are for ground level access

Annual Maintenance and Technical Analysis

- Qualified technician to perform 52 point Technical Analysis and document in an inspection report.
- Take a coolant sample to have Ring Power Oil Laboratory analyze for wear metals, contaminants, and coolant condition.
- Take an oil sample to have Ring Power Oil Laboratory analyze for wear metals, contaminants, and condition.
- Change engine oil filter(s), Change fuel filter(s) utilizing CAT Filters
- Drain engine crankcase oil & refill to proper capacity with CAT DEO ULS Oil
- Test run of the engine to ensure no leaks, will prime fuel system if necessary
- Dispose of used oil and filters adhering to EPA regulations
- Provide an Inspection report, this will advise of any problems noted with the unit. We will advise and secure your authorization
- A detailed report of all fluid analyses will be provided if any results appear to be actionable or as requested by the customer

NOTE:

1. The above price includes start-up, testing, and customer training.
2. No, fuel is included.
3. No third party testing or NETA testing included and is by others.
4. No sales tax included

DESCRIPTION OF MATERIAL	UNIT PRICE	EXTENSION
5. Training that is to be videotaped, requires Ring Power approval in advance. RPC "Video Recording Agreement" / waiver signed by the customer / end-user in advance. Videographer / Recording Equipment to be provided by others. 6. In some cases the enclosure, tank and exhaust are shipped loose, installation is by others. 7. Work to be done during normal business hours 8am to 4pm. 8. Proposal is based on information supplied by the Customer. 9. Generators that come with an 800 amp breaker or larger are supplied with buss bar, Lugs are by others. 10. No specifications, drawings, or diagrams were received or reviewed. General exception is taken to any other specifications and drawings not available at time of quotation. Equipment supplied will be limited to that described in this proposal. 11. Ring Power will be supplying equipment as described in the attached documentation. 12. For fuel tanks over 550 Gallons, it is the Contractor or Owners responsibility to notify the appropriate State, and/or local regulatory agencies <u>prior</u> to delivery of the fuel storage tank so that it can be inspected prior to fueling. The FDEP Registration form will be provided in the Ring Power Submittal. Per FDEP Breach of Integrity Testing Guidance, tanks will ship from the factory with a vacuum/gauge installed. On-site testing is not included. 13. Ring Power will not release equipment for production until we have received the signed sales agreement and signed and approved submittal from our customer. This is done to insure that we are providing quality equipment that fits our customer's needs. If you need any assistance, please contact your sales representative. 14. Under no circumstances does Ring Power accept any flow down provisions without specific written agreement between Ring Power and Buyer.		

Thank you for considering Ring Power Systems for your generator needs

Mark Barbarulo

Mark Barbarulo

Ring Power Systems, Generator Sales Central Florida,
407-472-6231 Office - 407-857-1592 Fax - 407-383-5840 Cell
Mark.barbarulo@ringpower.com



UNITED BLOWER INC., ESTABLISHED IN 1989, HAS OVER 10,000 BLOWER SYSTEMS INSTALLED TO DATE. WE SERVE THE WATER AND WASTEWATER MUNICIPAL MARKETS AS WELL AS PNEUMATIC AND INDUSTRIAL PLANT APPLICATIONS. OUR PRODUCT LINE INCLUDES A MULTITUDE OF STYLES RANGING FROM MULTISTAGE CENTRIFUGAL, REGENERATIVE, HIGH SPEED TURBO, AND POSITIVE DISPLACEMENT BLOWER PACKAGES. WE OFFER OUR FLAGSHIP PREMIUM PD QUIET PULSE PACKAGE AS WELL AS OUR ECONOMICAL ENVIROPAK, ECONOPAK, & ECONOTOP DESIGNS. UBI ALSO FURNISHES DROP-IN AND RETROFITTED BARE SHAFT BLOWER REPLACEMENTS IN ADDITION TO A VAST INVENTORY OF REPLACEMENT PARTS. LET UNITED BLOWER BECOME YOUR ONE STOP SHOP FOR ALL OF YOUR AERATION NEEDS.

QUIET PULSE PD BLOWER PACKAGES

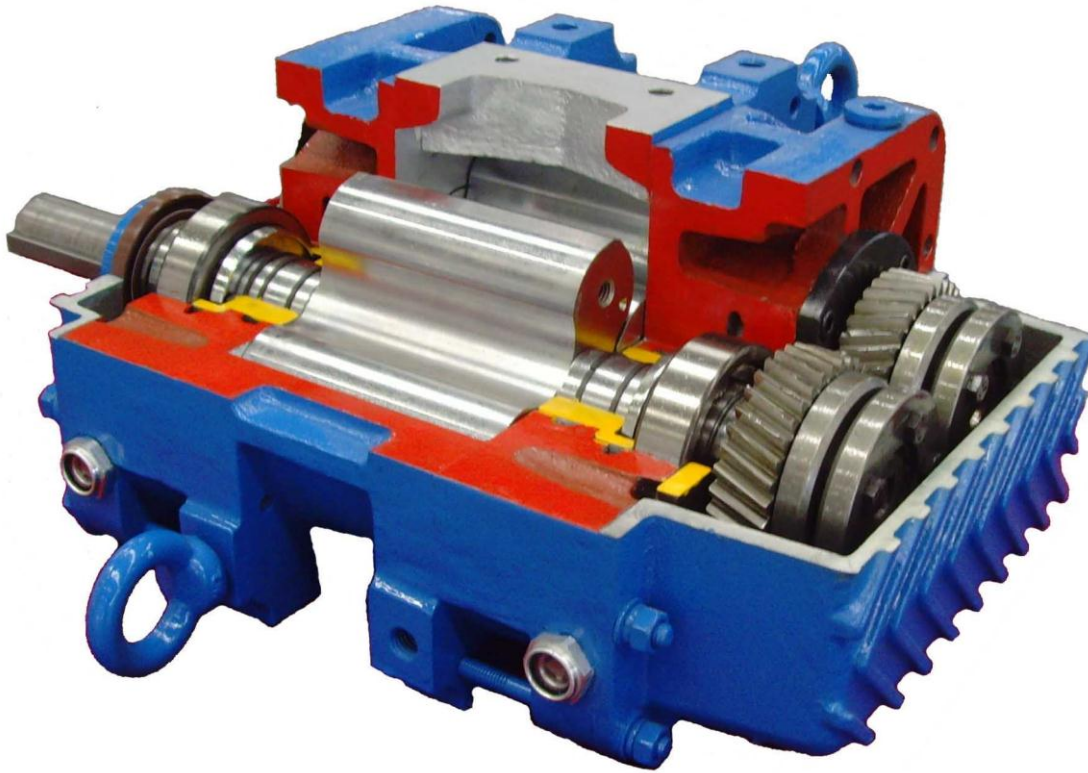


FEATURES

- PACKAGES MANUFACTURED IN BALL GROUND, GA SINCE 1989
- 230V/ 460V/ 575V UP TO 300 HORSEPOWER
- THREE-LOBE PD BLOWERS WITH PULSE CONTROL CHANNELS
- ALTERNATIVE ULTRA EFFICIENT TWO LOBE BLOWERS
- AUTOMATIC V-BELT TENSION SYSTEM
- 14-20 dB SOUND ATTENUATING ENCLOSURE
- 3-SIDED ACCESSIBLE SOUND ENCLOSURES
- FORKLIFT PICKUP CHANNELS
- 120V HIGH VOLUME ENCLOSURE EXHAUST FAN
- INSTRUMENTATION AS REQUIRED.

United Blower, Inc.
1198 Airport Dr
Ball Ground, GA 30107
Office: (770) 479-3000
www.unitedblowerinc.com
sales@unitedblower.com





UBI THREE LOBE PD BLOWER CUTAWAY

UBI BLOWER CONSTRUCTION FEATURES

Seals – Non-contacting piston ring type air seals minimize air leakage and maintenance costs. Piston ring oil seals in combination with the deflector ring, ensure that no oil leakage will occur. A viton lip seal on a wearable shaft sleeve with O-rings prevents oil from leaking past the drive shaft – thus extending the life of the shaft.

Oil Site Glasses – Oversized heavy duty site glasses with fused rubber and brass seal washers. Magnetized drain plugs are used to capture any metallic contaminants.

Lubrication – The splash lubrication design of the UBI blowers ensures adequate lubrication of timing gears and bearings. This means long bearing and gear life and minimizes maintenance costs. The blower has two separate oil chambers each with oil sight glasses.

Shafts – Fatigue resistant tool steel ground shafts, using the latest technologies to improve balance and torque ratings.

DESIGN & CONSTRUCTION FEATURES

Impeller Case – The impeller case is made of high strength, close grained grey cast iron (ASTM 48 No.35). Adequate ribbing resists deflection and facilitates cooling. Precision machining minimizes clearances. A specially designed pulsation control channel, in the case, reduces noise levels. The unique housing design permits horizontal or vertical blower installation with no modifications. Precision machined port adapters in threaded and flanged styles allow for versatility in piping design. Casing integrity is tested at 35 PSIG.

Endplates – The endplates are made of high strength, close grained grey cast iron. Both endplates are identical. Bearing bores are precision machined in the endplates to ensure accurate positioning of the impellers in the main case.

Rotor Assemblies – One-piece rotor assemblies are precision machined from high strength, close grained ductile cast iron (ASTMA536 65-45-12). This permits smooth efficient operation at all speeds and pressures. Large diameter input shafts are designed to carry higher loads without fear of shaft breakage. UBI blowers can be driven by direct coupling, V-belt transmission, gearboxes, or variable speed drives for optimum blower performance. The rotor assemblies are dynamically balanced to very precise tolerances to minimize vibration, following ISO 1940/ ANSI S2.19 G2.5.

Bearings – UBI blowers are equipped with large heavy-duty bearings for well over 100,000 hrs B10 bearing life. Bearings are selected to handle high radial loads without sacrificing product integrity and reliability, ensuring a minimum life expectancy of 5 years between overhauls. Gear end bearings are angular contact ball bearing. Drive end bearings are straight roller bearings.

Timing Gears – UBI blowers are equipped with precision ground helical timing gears (20CrMnTi), which are quieter than spur gears. They are case hardened and ground per AGMA 12 with safety factor of 1.7. Timing gears maintain inter-lobe clearance.

Testing – Every UBI blower is given a 2 hour mechanical run test at maximum differential pressure prior to shipping from the factory. This guarantees flawless, trouble free operation right from the start.

Warranty – Each UBI bareshaft blower is covered by an exclusive 30 months warranty against defects in materials and workmanship after delivery of 24 months from equipment startup, whichever comes first. Please refer to the warranty for details.

DESIGN & CONSTRUCTION FEATURES

OPERATIONAL OVERVIEW

To develop pressure and move air, two tri-lobe rotors, synchronized by a pair of timing gears, rotate in opposite directions in two cylindrical bores within the housing.

A defined quantity of air entering the inlet port is trapped between the rotor and the housing and is carried over to the discharge port against the pressure from the application. The pressure developed depends upon the resistance of the system as well as the inlet and discharge pressures.

Each trapped volume occurs three times every revolution for each rotor, commonly referred to as the volume flow per revolution. Multiplying this by the shaft speed will define the flow rate entering the inlet port. Changing the rotational speed directly affects the volume flow.

Simultaneously, the synchronized rotors and housing serve to prevent back flow by the close proximity of the rotors to one another and the proximity of the rotors to the housing.

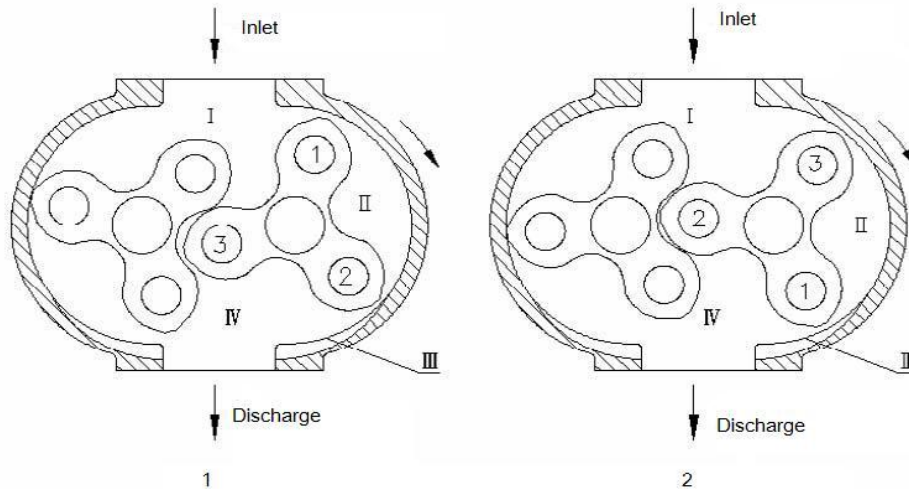
Because there is no contact between the rotors and the case, there is no wear and no lubrication is required. Oil is, however, required to lubricate the bearings and gears. The lack of contact means that some leakage occurs, and the rate is directly related to the pressure differential between ports. As the pressure differential increases, the leakage rate increases.

Furthermore, as the leakage rate increases the adiabatic efficiency decreases, increasing the discharge temperature and power requirement.

The net flow rate and efficiency is then dependent upon the shaft speed, volume flow per revolution, and leakage rate at the operational pressure point.

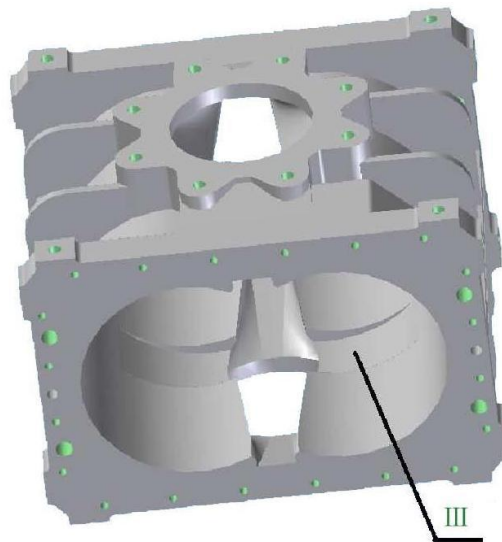
DESIGN & CONSTRUCTION FEATURES

EXPLANATION OF THE PULSATION CONTROL FEATURE

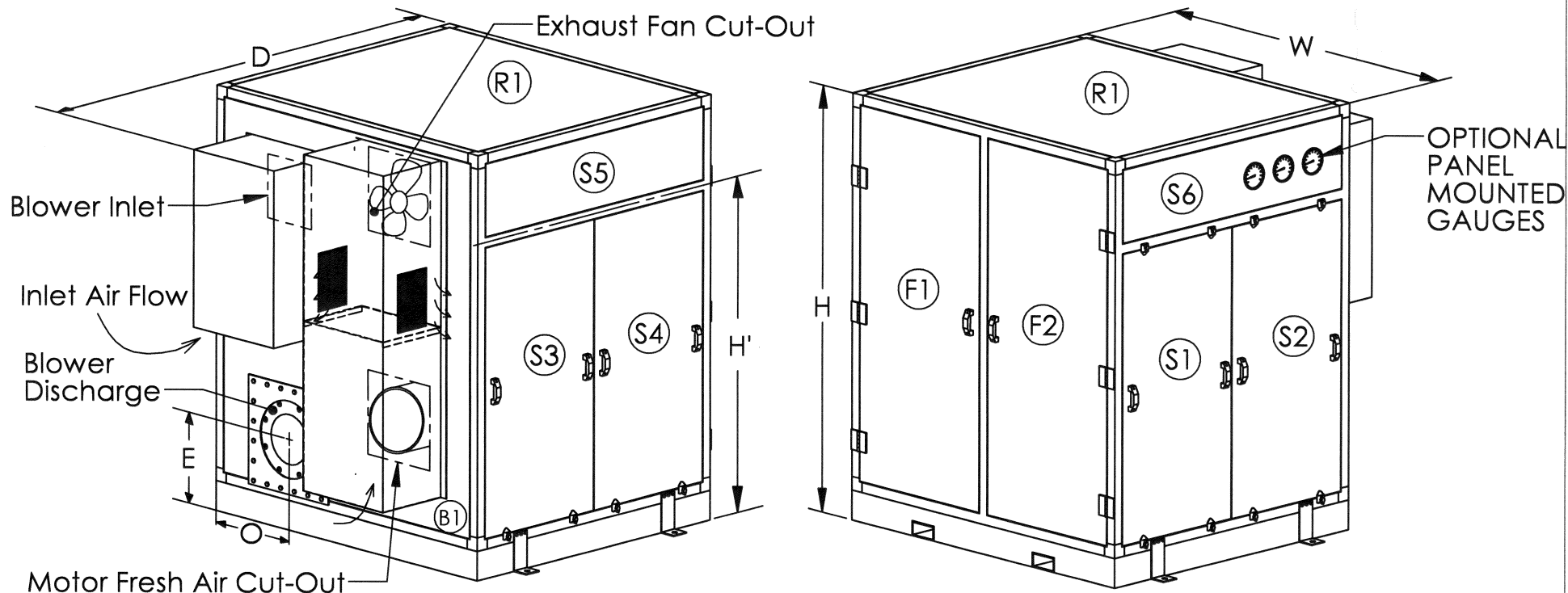


Zone 1 is the inlet low pressure zone; Zone 2 is the transitional zone; Zone 3 is the reverse flow zone; Zone 4 is the outlet high pressure zone.

The three lobes are marked as lobe "1". "2". "3." When rotating, the space between lobe 1 and lobe 3 brings low pressure air from Zone 1 to Zone 2. At this time, an enclosed space is formed between lobe 1, lobe 3 and the case. As the rotor turns, Zone 2 air merges and mixes with Zone 3 air (The growing distance between the case and the lobe permits this mixing to occur). This means the high pressure air in Zone 4 mixes with Zone 2 through Zone 3. Because of the small flow channel section of Zone 3, the air pressure in Zone 2 increases more gradually, than if the space did not exist: the air flow pulsation and vibration is weakened. Subsequently, the noise is lower. If Zone 3 did not exist (the internal reverse flow zone), when Zone 2 air merges with Zone 4 air the large amount of high pressure air in Zone 4 will rush into the lower pressure Zone 2 and make a big pressure wave, causing a pressure pulse.



The internal reverse flow structure feature (Zone 3) in the case of the UBI Series tri-lobe blowers can effectively reduce the pressure pulse, and reduce noise.



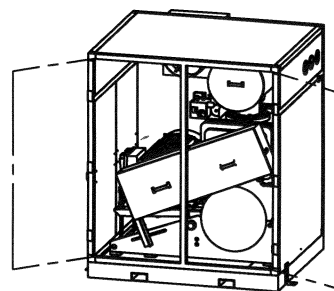
PANEL LAYOUT:

- F1: HINGED SINGLE PANEL; SIZE 1-2
- F1 & F2: HINGED DOUBLE PANEL; SIZE 3-5
- S1: LIFTOFF SINGLE PANEL; SIZE 1-2
- S1 & S2: LIFTOFF DOUBLE PANELS; SIZES 3-5
- S5 & S6: FIXED UPPER PANEL; ALL SIZES
- B 1: FIXED PANEL; ALL SIZES
- R1: REMOVABLE PANEL; ALL SIZES

QUIET PULSE BLOWER PACKAGE FEATURES:

- 18GA GALVANIZED PANELS- POWDERCOATED LIGHT GREY
- 2" ALUMINUM FRAME- POWDERCOATED CAPRI BLUE
- 2" ACOUSTICAL FOAM INSULATION - STANDARD 14-18 dBA
- 2" MINERAL WOOL INSULATION W/ PERF-OPTIONAL UPGRADE 18-20 dBA
- 2" FOAM INSULATED HOODS
- 120V EXHAUST FAN WITH THERMOSTAT
- SUBBASE WITH FRONT FORKLIFT PICKUP & OIL DRIP PAN
- EASY BLOWER PACKAGE ACCESS

DIMENSION (INCHES)	SIZE 1 BLOWERS: UBI 50 / 65 MAX HP: 20	SIZE 2 BLOWERS: UBI 80 / 100 MAX HP: 40	SIZE 3 BLOWERS: UBI 125 / 150 MAX HP: 75	SIZE 4 BLOWER: UBI 175 MAX HP: 125	SIZE 5 BLOWERS: UBI 200 / 250 MAX HP: 200	SIZE 6 BLOWER: UBI 290 / 300 MAX HP: 300
W	40	50	60	72	72	84
H	51	65	72	82	86	102
H'	36	49	57	62	66	80
D	46	59	67	80	80	108
E	12	13	15	18	18	23
O	11	15 -1/8	17 -1/8	20 -5/8	20 -1/8	22 -1/8



UBI UNITED BLOWER INC.
 1198 AIRPORT DR
 BALLGROUND, GA 30107
 T: 770-479-3000
 F: 770-479-3111

QUIET PULSE
 SIZE 1-6
 NOISE ENCLOSURE
 COMPONENT LAYOUT





Packaged Systems & Distribution By:

United Blower, Inc.

1198 Airport Dr

Ball Ground, GA 30107

Office: (770) 479-3000

www.unitedblowerinc.com

sales@unitedblower.com

Ring Power®



Power Systems Division

500 World Commerce Parkway
St. Augustine, Florida 32092
www.ringpower.com
(904) 737-7730

Submittal Data

Prepared For:
City of Ocoee
1 North Bluford Ave
Ocoee, FL 334761

Ocoee WTP

Caterpillar C32 1000kW
Generator Set

Ring Power Project Number: 230752
Project Manager: George Soha
Salesman: Mark Barbarulo

Your North and Central Florida Caterpillar® Dealer

Ring Power Corp
500 World Commerce Parkway
St. Augustine, Florida 32092
904-737-7730

10/2023

Dear Customer:

The submittal information contained in the following pages contains technical data on your project including product specifications, drawings and start-up requirements. Your project is currently **"Released for Production"**. All equipment has been placed on order as submitted upon; however, we recommend you review this document, as any changes or deviations may require a change order involving additional costs. Please return either the corrected copy with the Letter of Submittal Return or the Letter of Submittal Approval to your Project Manager, George Soha, at your earliest convenience.

If you have any general or technical questions please contact them at:

Office: (407) 472-6272
Fax: (407) 438-0922
Email: george.soha@ringpower.com

If you need pricing assistance with future projects, please contact your sales representative, Mark Barbarulo, at:

Office: (407) 472-6231
Mobile: (407) 383-5840
Email: mark.barbarulo@ringpower.com

Thank you,

Peggy Wallace
Manager - Project Management Office
Power Systems Division
Ring Power Corporation
(904) 494-1290
peggy.wallace@RingPower.com



Power Systems Division

Ring Power Corp
500 World Commerce Parkway
St. Augustine, Florida 32092
904-737-7730

Letter of Submittal Approval
Project # 230752
Project Name: Ocoee WTP

I have reviewed the information contained in the Engineering Submittal and agree that the products, specifications and content meet the technical requirements of this project. I thereby approve this Engineering Submittal as provided.

Customer Signature

Date

Ring Power Project Manager

Date Received

Letter of Submittal Return
Project # 230752
Project Name: Ocoee WTP

I have reviewed the information contained in the Engineering Submittal, made the applicable changes and returned the original copy for your review and correction.

Customer Signature

Date

Ring Power Project Manager

Date Received

TABLE OF CONTENTS

PROJECT NAME: 230752
PROJECT NUMBER: Ocoee WTP

1. GENERATOR SET

Generator Set Specification Sheet
Generator Technical Data
Generator Set Package Performance Data
Package Data
Systems Data
Permanent Magnet
Excitation Module
Engine Controller
Generator Set Controller

2. ACCESSORIES

Generator Circuit Breaker
Battery Charger
Batteries
Jacket Water Heater
Phoenix Cutsheet
Phoenix Electrical Cutsheet

3. DRAWINGS

Cable Connections / Sizing
Phoenix Fuel Tank Drawings
Generator Set Pad Outline
Generator Set – Mechanical
Generator Set – Electrical
Phoenix Electrical

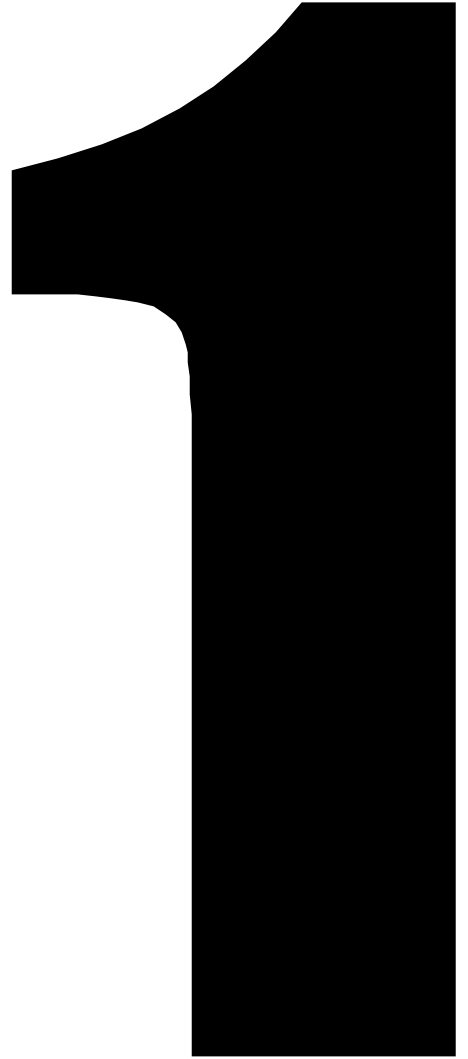
4. GENERAL INFORMATION

Fuel Tank Registration Information
Division of Responsibilities
Pre Start-Up Checklist
Caterpillar Limited Warranty Statement
Equipment Lifting Diagram
UL 2200 Listing
Generator Set Prototype Testing Statement

5. ATS / SWITCHGEAR

Drawings
Outline & Mounting Diagram
Wiring Diagram
Equipment Brochure
Warranty Statement

(*) INDICATES ITEMS SHIPPED LOOSE. INSTALLATION / ASSEMBLY IS THE RESPONSIBILITY OF THE CUSTOMER / CONTRACTOR.



GENERATOR SET

Cat® C32

Diesel Generator Sets



Image shown may not reflect actual configuration

Bore – mm (in)	145 (5.7)
Stroke – mm (in)	162 (6.4)
Displacement – L (in ³)	32.1 (1959)
Compression Ratio	15.0:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A4

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
1000 (1250)	1000 (1250)	910 (1137)	830 (1038)	U.S. EPA Certified for Emergency Stationary Applications (Tier 2)

Standard Features

Cat® Diesel Engine

- Designed and tested to meet the U.S. EPA Emergency Stationary (Tier 2) emissions
- Reliable and consistent performance proven in thousands of applications worldwide

Generator Set Package

- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements.
- Reliability is verified through prototype testing, which includes torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators

- Superior motor starting capability minimizes the need for oversizing the generator
- Designed to match the performance and output characteristics of Cat diesel engines

Cooling System

- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

EMCP 4 Control Panels

- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty

- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support

- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing

- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

Optional Equipment

Engine

Air Cleaner

- ☐ Single element
- ☐ Dual element
- ☐ Heavy duty

Muffler

- ☐ Industrial grade (15 dB)

Starting

- ☐ Standard batteries
- ☐ Oversized batteries
- ☐ Standard electric starter
- ☐ Dual electric starter
- ☐ Jacket water heater

Alternator

Output voltage

- ☐ 220V ☐ 480V
- ☐ 240V ☐ 600V
- ☐ 380V ☐ 2400V
- ☐ 400V ☐ 4160V

Temperature Rise (over 40°C ambient)

- ☐ 150°C
- ☐ 125°C/130°C
- ☐ 105°C
- ☐ 80°C

Winding type

- ☐ Random wound
- ☐ Form wound

Excitation

- ☐ Self excited
- ☐ Internal excitation (IE)
- ☐ Permanent magnet (PM)

Attachments

- ☐ Anti-condensation heater
- ☐ Stator and bearing temperature monitoring and protection

Power Termination

Type

- ☐ Bus bar
- ☐ Circuit breaker
- ☐ 400A ☐ 800A
- ☐ 1200A ☐ 1600A
- ☐ 2000A ☐ 2500A
- ☐ 3000A ☐ 3200A
- ☐ UL ☐ IEC
- ☐ 3-pole ☐ 4-pole
- ☐ Manually operated
- ☐ Electrically operated

Trip Unit

- ☐ LSI ☐ LSI-G
- ☐ LSI-G-P

Factory Enclosure

- ☐ Weather protective
- ☐ Sound attenuated

Attachments

- ☐ Cold weather bundle
- ☐ DC lighting package
- ☐ AC lighting package
- ☐ Motorized louvers

Fuel Tank

- ☐ Sub-base
- ☐ 1000 gal (3875 L)
- ☐ 2000 gal (7570 L)
- ☐ 3600 gal (13627 L)

Control System

Controller

- ☐ EMCP 4.2B
- ☐ EMCP 4.3
- ☐ EMCP 4.4

Attachments

- ☐ Local annunciator module
- ☐ Remote annunciator module
- ☐ Expansion I/O module
- ☐ Remote monitoring software

Charging

- ☐ Battery charger – 10A

Vibration Isolators

- ☐ Rubber
- ☐ Spring
- ☐ Seismic rated

Cat Connect

Connectivity

- ☐ Ethernet
- ☐ Cellular
- ☐ Satellite

Extended Service Options

Terms

- ☐ 2 year (prime)
- ☐ 3 year
- ☐ 5 year
- ☐ 10 year

Coverage

- ☐ Silver
- ☐ Gold
- ☐ Platinum
- ☐ Platinum Plus

Ancillary Equipment

- ☐ Automatic transfer switch (ATS)
- ☐ Uninterruptible power supply (UPS)
- ☐ Paralleling switchgear
- ☐ Paralleling controls

Certifications

- ☐ UL 2200 Listed
- ☐ CSA
- ☐ IBC seismic certification
- ☐ OSHPD pre-approval

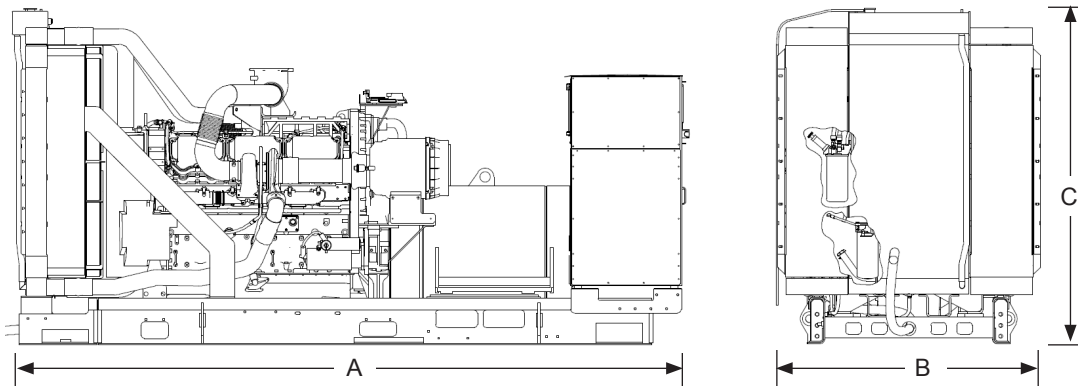
Note: Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.

Package Performance

Performance	Standby		Mission Critical		Prime		Continuous	
Frequency	60 Hz		60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	1000 ekW		1000 ekW		910 ekW		830 ekW	
Gen set power rating with fan @ 0.8 power factor	1250 kVA		1250 kVA		1138 kVA		1038 kVA	
Fueling strategy	EPA ESE (Tier 2)		EPA ESE (Tier 2)		EPA ESE (Tier 2)		EPA ESE (Tier 2)	
Performance number	DM9933-03		EM0449-00		DM9934-04		DM9935-03	
Fuel Consumption								
100% load with fan – L/hr (gal/hr)	272.1	(71.9)	272.1	(71.9)	248.6	(65.7)	232.1	(61.3)
75% load with fan – L/hr (gal/hr)	213.4	(56.4)	213.4	(56.4)	197.0	(52.0)	176.5	(46.6)
50% load with fan – L/hr (gal/hr)	144.7	(38.2)	144.7	(38.2)	134.2	(35.5)	122.9	(32.5)
25% load with fan – L/hr (gal/hr)	82.6	(21.8)	82.6	(21.8)	78.5	(20.7)	73.4	(19.4)
Cooling System								
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m³/min (cfm)	1175	(41494)	1175	(41494)	1175	(41494)	1175	(41494)
Engine coolant capacity – L (gal)	55.0	(14.5)	55.0	(14.5)	55.0	(14.5)	55.0	(14.5)
Radiator coolant capacity – L (gal)	36.0	(9.0)	36.0	(9.0)	36.0	(9.0)	36.0	(9.0)
Total coolant capacity – L (gal)	91.0	(23.5)	91.0	(23.5)	91.0	(23.5)	91.0	(23.5)
Inlet Air								
Combustion air inlet flow rate – m³/min (cfm)	87.6	(3094.1)	87.6	(3094.1)	83.7	(2954.5)	80.0	(2825.6)
Exhaust System								
Exhaust stack gas temperature – °C (°F)	476.4	(889.5)	476.4	(889.5)	459.5	(859.1)	461.2	(862.1)
Exhaust gas flow rate – m³/min (cfm)	228.4	(8065.3)	228.4	(8065.3)	212.1	(7488.7)	204.8	(7231.2)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)
Heat Rejection								
Heat rejection to jacket water – kW (Btu/min)	352	(20033)	352	(20033)	327	(18624)	307	(17468)
Heat rejection to exhaust (total) – kW (Btu/min)	1024	(58206)	1024	(58206)	933	(53072)	896	(50940)
Heat rejection to aftercooler – kW (Btu/min)	288	(16385)	288	(16385)	255	(14526)	230	(13082)
Heat rejection to atmosphere from engine – kW (Btu/min)	127	(7238)	127	(7238)	116	(6625)	114	(6486)
Heat rejection from alternator – kW (Btu/min)	55	(3131)	55	(3131)	50	(2846)	45	(2561)
Emissions* (Nominal)								
NOx mg/Nm³ (g/hp-h)	2348.6	(4.93)	2348.6	(4.93)	2293.5	(4.81)	1969.0	(4.23)
CO mg/Nm³ (g/hp-h)	62.1	(0.13)	62.1	(0.13)	59.2	(0.12)	52.5	(0.11)
HC mg/Nm³ (g/hp-h)	5.5	(0.01)	5.5	(0.01)	7.0	(0.02)	12.7	(0.03)
PM mg/Nm³ (g/hp-h)	7.2	(0.02)	7.2	(0.02)	6.6	(0.02)	7.1	(0.02)
Emissions* (Potential Site Variation)								
NOx mg/Nm³ (g/hp-h)	2841.6	(5.97)	2841.6	(5.97)	2775.2	(5.83)	2382.5	(5.11)
CO mg/Nm³ (g/hp-h)	116.1	(0.24)	116.1	(0.24)	110.6	(0.23)	98.1	(0.21)
HC mg/Nm³ (g/hp-h)	10.3	(0.03)	10.3	(0.03)	13.2	(0.03)	24.1	(0.06)
PM mg/Nm³ (g/hp-h)	14.1	(0.04)	14.1	(0.04)	12.9	(0.03)	13.9	(0.04)

*mg/Nm³ levels are corrected to 5% O₂. Contact your local Cat dealer for further information.

Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
4165 (164.0)	1684 (66.3)	2162 (85.1)	6668 (14,700)

Note: For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.

Ratings Definitions

Standby

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime

Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated kW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous

Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

Applicable Codes and Standards

AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications

- ISO 8528-1 Data Center Power (DCP) compliant per DCP application of Cat diesel generator set prime power rating.
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates

Fuel rates are based on fuel oil of 35° API [16°C (60°F)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29°C (85°F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

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Materials and specifications are subject to change without notice.
 The International System of Units (SI) is used in this publication.

GENERATOR DATA

(AT400240)-ENGINE (BAA126422A)-CEM

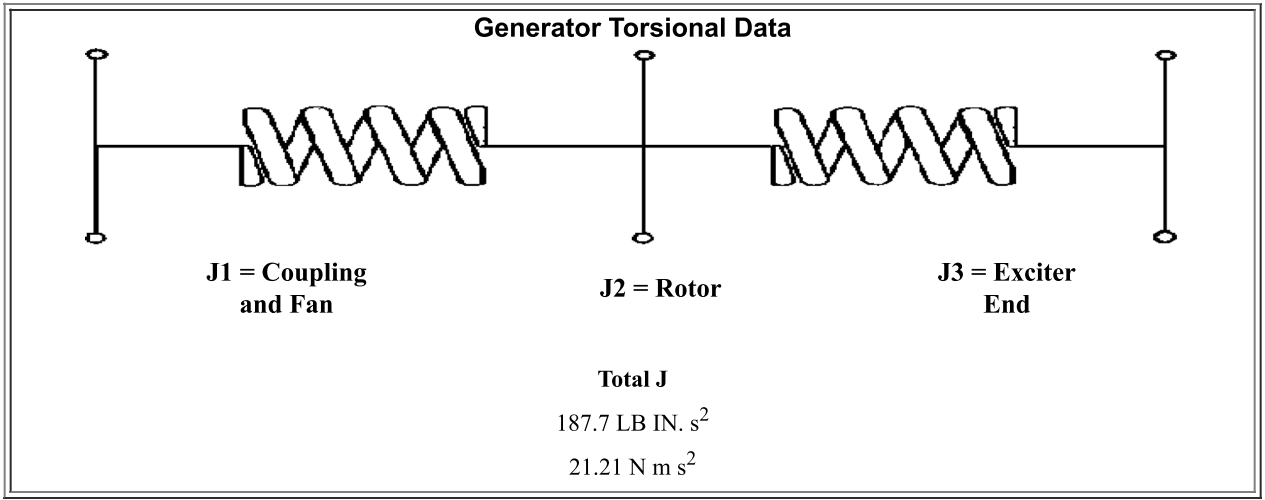
Selected Model			
Engine: C32	Generator Frame: E3855L4	Genset Rating (kW): 1000.0	Line Voltage: 480
Fuel: Diesel	Generator Arrangement: 6145656	Genset Rating (kVA): 1250.0	Phase Voltage: 277
Frequency: 60	Excitation Type: Permanent Magnet	Pwr. Factor: 0.8	Rated Current: 1503.5
Duty: STANDBY	Connection: PARALLEL STAR	Application: EPG	Status: Current
Version: 20239 /20239 /20239 /677263			

Spec Information			
Generator Specification			Generator Efficiency
Frame: E3855L4	Type: SR500	No. of Bearings: 1	Per Unit Load kW Efficiency %
Winding Type: RANDOM WOUND			Flywheel: 18.0
Connection: PARALLEL STAR			Housing: 0
Phases: 3			No. of Leads: 12
Poles: 4			
Sync Speed: 1800			Generator Pitch: 0.6667
Reactances			Per Unit Ohms
SUBTRANSIENT - DIRECT AXIS X'' _d			0.0825 0.0152
SUBTRANSIENT - QUADRATURE AXIS X'' _q			0.1600 0.0295
TRANSIENT - SATURATED X' _d			0.1600 0.0295
SYNCHRONOUS - DIRECT AXIS X _d			3.4142 0.6293
SYNCHRONOUS - QUADRATURE AXIS X _q			1.2061 0.2223
NEGATIVE SEQUENCE X ₂			0.1204 0.0222
ZERO SEQUENCE X ₀			0.0347 0.0064
Time Constants			Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T' _{d0}			8.1000
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T' _d			0.2450
OPEN CIRCUIT SUBTRANSIENT - DIRECT AXIS T'' _{d0}			0.0349
SHORT CIRCUIT SUBTRANSIENT - DIRECT AXIS T'' _d			0.0180
ARMATURE SHORT CIRCUIT T _a			0.0240
Short Circuit Ratio: 0.392 Stator Resistance = 0.008 Ohms Field Resistance = 2.5 Ohms			

Voltage Regulation		Generator Excitation	
Voltage level adjustment: +/-	5.0%	No Load	Full Load, (rated) pf
Voltage regulation, steady state: +/-	0.5%	Series	
Voltage regulation with 3% speed change: +/-	0.5%	Excitation voltage:	15.95 Volts 40.64 Volts
Waveform deviation line - line, no load: less than	2.0%	Excitation current	1.5 Amps 3.82 Amps
Telephone influence factor: less than	40		

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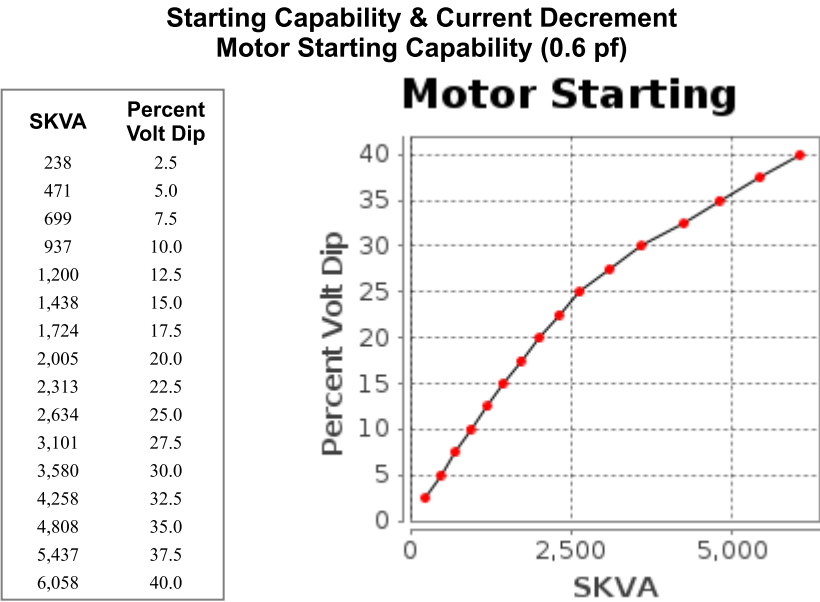
Generator Mechanical Information		
Center of Gravity		
Dimension X	-692.0 mm	-27.2 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.
"X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details "Y" is measured vertically from rotor center line. Up is positive. "Z" is measured to left and right of rotor center line. To the right is positive.		
Generator WT = 2370 kg * Rotor WT = 905 kg * Stator WT = 1215 kg		
5,225 LB 1,995 LB 2,679 LB		
Rotor Balance = 0.016 mm deflection PTP		
Overspeed Capacity = 125% of synchronous speed		



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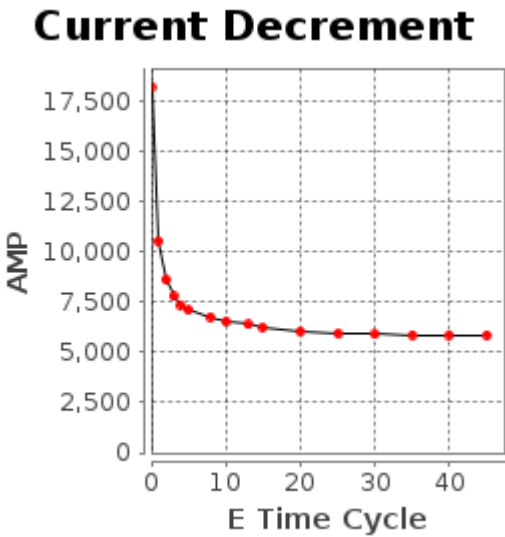
Generator Cooling Requirements - Temperature - Insulation Data			
Cooling Requirements:		Temperature Data: (Ambient 40 °C)	
Heat Dissipated:	40.0 kW	Stator Rise:	105.0 °C
Air Flow:	108.0 m ³ /min	Rotor Rise:	105.0 °C
Insulation Class: H			
Insulation Reg. as shipped: 100.0 MΩ minimum at 40 °C			
Thermal Limits of Generator			
Frequency:	60 Hz		
Line to Line Voltage:	480 Volts		
B BR 80/40	1120.0 kVA		
F BR -105/40	1300.0 kVA		
H BR - 125/40	1400.0 kVA		
H PR - 150/40	1450.0 kVA		

Selected Model			
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Current Decrement Data

E Time Cycle	AMP
0.0	18,225
1.0	10,554
2.0	8,629
3.0	7,779
4.0	7,361
5.0	7,122
8.0	6,771
10.0	6,544
13.0	6,381
15.0	6,246
20.0	6,062
25.0	5,957
30.0	5,901
35.0	5,877
40.0	5,871
45.0	5,875



Instantaneous 3 Phase Fault Current: 18225 Amps

Instantaneous Line - Line Fault Current: 15856 Amps

Instantaneous Line - Neutral Fault Current: 23692 Amps

Selected Model

Engine: C32Generator Frame: E3855L4Genset Rating (kW): 1000.0Line Voltage: 480

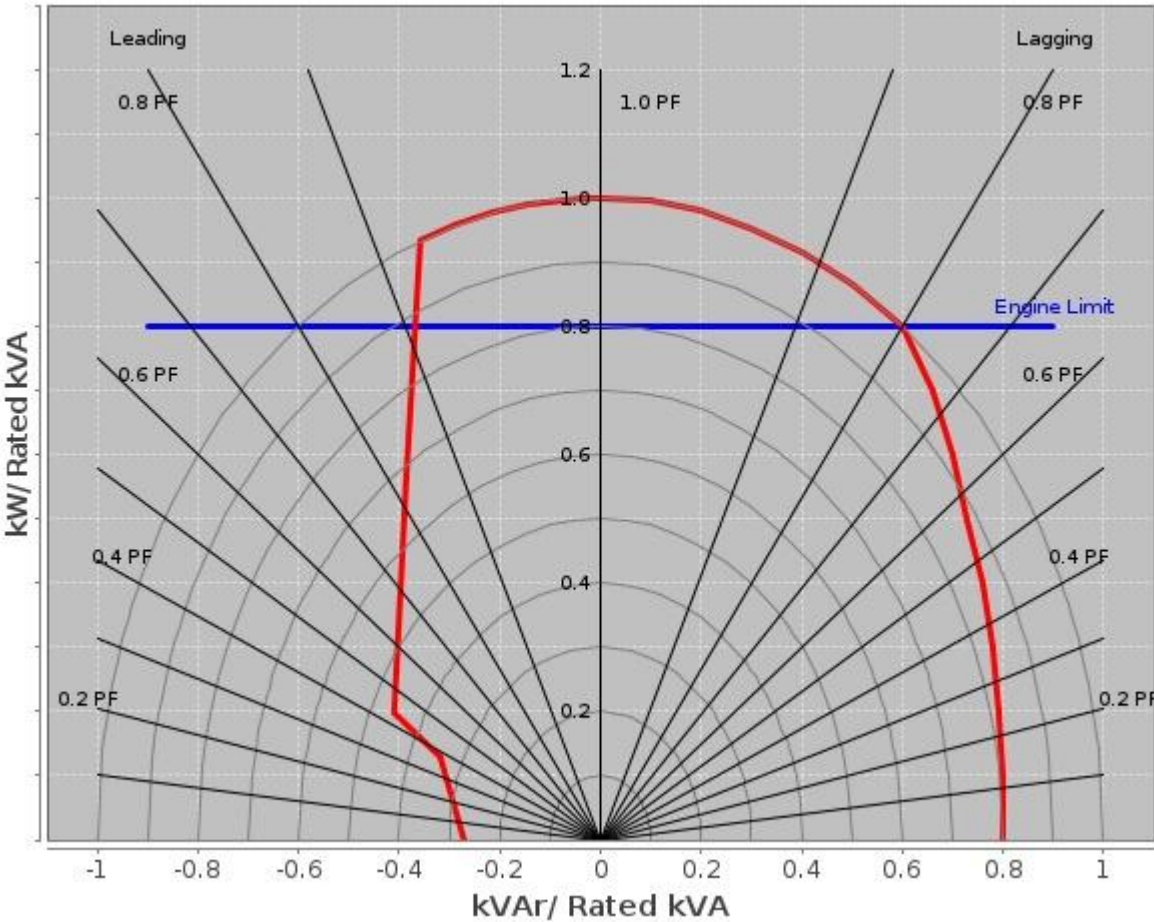
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Reactive Capability Curve
Operating Chart



Selected Model

Engine: C32Generator Frame: E3855L4Genset Rating (kW): 1000.0Line Voltage: 480

Fuel: DieselGenerator Arrangement: 6145656Genset Rating (kVA): 1250.0Phase Voltage: 277

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Duty: STANDBYConnection: PARALLEL STARApplication: EPGStatus: Current

Version: 20239 /20239 /20239 /677263

General Information

DM7802
GENERATOR GENERAL INFORMATION

- I. GENERATOR MOTOR STARTING CAPABILITY CURVES
- A. THE MOTOR STARTING CURVES ARE REPRESENTATIVE OF THE DATA OBTAINED BY THE FOLLOWING PROCEDURE:
1. THE CATERPILLAR GENERATOR IS DRIVEN BY A SYNCHRONOUS DRIVER.
 2. VARIOUS SIZE THREE PHASE INDUCTION MOTORS (NEMA CODE F) ARE STARTED ACROSS THE LINE LEADS OF THE UNLOADED GENERATOR.
 3. THE RESULTING VOLTAGE DIPS ARE RECORDED WITH AN OSCILLOSCOPE.
 4. MOTOR HORSEPOWER HAS BEEN CONVERTED TO STARTING KILOVOLT AMPERES (SKVA).
 5. RECORDED VOLTAGE DIPS HAVE BEEN EXPRESSED AS A OF GENERATOR RATED VOLTAGE.

- II. USE OF THE MOTOR STARTING CAPABILITY CURVES.
- A. CALCULATE THE SKVA REQUIRED BY THE MOTOR FOR FULL VOLTAGE STARTING ACROSS THE LINE IF THE VALUE IS NOT LISTED ON THE MOTOR DATA PLATE.
1. MOTORS CONFORMING TO NEMA STANDARDS
MULTIPLY THE MOTOR HORSEPOWER BY THE NEMA SKVA/HP FIGURE. FOR NEMA CODE F,USE 5.3 SKVA/HP; FOR NEMA CODE G, USE 6.0 SKVA/HP.
 2. ALL OTHER MOTORS:
MULTIPLY THE RATED VOLTAGE BY THE LOCKED ROTOR AMPERE AND BY 0.001732. (IF THE LOCKED ROTOR AMPERES ARE NOT LISTED, MULTIPLY THE FULL LOAD (RUNNING) AMPERES BY
- B. USE THE ABOVE SKVA WITH THE MOTOR STARTING TABLE.
1. ACROSS LINE STARTING:
READ ACROSS THE ROW OF "ACROSS THE LINE STARTING SKVA IF THE DESIRED VALUE OF SKVA IS NOT GIVEN, CALCULATE THE DIP BY FINDING THE PROPER SKVA INTERVAL AND INTERPOLATING AS FOLLOWS:
SKVA1 IS THE SKVA TABLE ENTRY JUST SMALLER THAN THE DESIRED SKVA, DIP1 IS THE DIP FOR SKVA2, AND SKVA2 IS THE SKVA TABLE ENTRY JUST GREATER THAN THE DESIRED SKVA. THE DIP (IN PERCENT) AT THE DESIRED SKVA IS:
$$DIP = DIP1 + (SKVA - SKVA1) * 2.5 / (SKVA2 - SKVA1)$$

NOTE:VOLTAGE DIPS GREATER THAN 35% MAY CAUSE MAGNETIC CONTACTORS TO DROP OUT.

2. REDUCED VOLTAGE STARTING:
REFER TO THE FOLLOWING TABLE. MULTIPLY THE CALCULATE ACROSS LINE SKVA BY THE MULTIPLIER LISTED FOR THE SPECIFIC STARTING METHOD. APPLY THE RESULT TO THE STARTING TABLE AS IN II A, TO CALCULATE THE EXPECTED VOLTAGE DIP:

TYPE OF REDUCED VOLTAGE STARTING	MULTIPLY LINE SKVA BY
80% TAP	.80
65% TAP	.65
50% TAP	.50
45% TAP	.45
Wye start,delta run	.33

AUTOTRANSFORMER	
80% TAP	.68
65% TAP	.46
50% TAP	.29

NOTE: REDUCE VOLTAGE STARTING LOWERS THE MAXIMUM REQUIRED MOTOR skVA.

3. Part winding starting:
Most common is half-winding start, full-winding run.
Multiply the full motor, accross line starting skVA by 0.6. Apply the result to the selected curve as in ii. A above. Read the expected voltage dip, for the required skVA.

- III.DEFINITION:
- A. GENERATOR TERMS
- MODEL: Engine Sales model
- ENG TYPE: DI = Direct Injection,
- NA = Naturally aspirated, etc
- HZ: Running frequency, hertz
- RATING TYPE: PP, SB (prime power or standby)

KW: Base rating electrical kilowatts (ekW)
VOLTS: Rating terminal, line to line
GEN ARR: Cat generator arrangement part number
GEN FRAME: Generator frame size designation
CONN: Generator output connection
(star, wye, delta, ect.)
POLES: Number of pole pieces on rotor.
(eg. A 4 pole generator run at 1800)
RPM will produce 60 Hz alternating current. A 6 pole
generator run at 1200 RPM will produce 60 Hz alternating
current.)

B. GENERATOR TEMPERATURE RISE:
The indicated temperature rise indicated the NEMA limits
for standby or prime power applications. These rises are
used for calculating the losses and efficiencies and are
not necessarily indicative of the actual temperature rise
of a given machine.

C. CENTER OF GRAVITY
The specified center of gravity is for the generator only.
For single bearing, and two bearing close coupled generators, the cent
er of gravity is measured from the generator/engine flywheel housing i
nterface and from the centerline of the rotor shaft.

For two bearing, standalone generators, the center of gravity is measu
red from the end of the rotor shaft and from the centerline of the rot
or shaft.

For two bearing, standalone generators, the center of gravity is measu
red from the end of the rotor shaft and from the centerline of the rot
or shaft.

D. GENERATOR DECREMENT CURRENT CURVES

The generator decrement current curve gives the
symmetrical current supplied by the generator for a three
phase bolted fault at the generator terminals. Generators
equipped with the series boost attachment or generators
with PM excitation system will supply 300% of rated current
for at least 10 seconds.

E. GENERATOR EFFICIENCY CURVES
The efficiency curve is representative of the overall
generator efficiency over the normal range of the
electrical load and at the specified parameters. This is
not the overall engine generator set efficiency curve.

PERFORMANCE DATA [C32DRA0]

Perf No: DM9933

Change Level: 04

General

Heat Rejection

Emissions

Regulatory

Altitude Derate

Cross Reference

Perf Param Ref

View PDF

SALES MODEL:	C32	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,800
MACHINE SALES MODEL:		HERTZ:	60
ENGINE POWER (BHP):	1,474	FAN POWER (HP):	56.3
GEN POWER WITH FAN (EKW):	1,000.0	ASPIRATION:	TA
COMPRESSION RATIO:	15.0	AFTERCOOLER TYPE:	ATAAC
RATING LEVEL:	STANDBY	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
PUMP QUANTITY:	1	INLET MANIFOLD AIR TEMP (F):	120
FUEL TYPE:	DIESEL	JACKET WATER TEMP (F):	210.2
MANIFOLD TYPE:	DRY	TURBO CONFIGURATION:	PARALLEL
GOVERNOR TYPE:	ADEM4	TURBO QUANTITY:	2
ELECTRONICS TYPE:	ADEM4	TURBOCHARGER MODEL:	GTB45518BS-52T-1.37
IGNITION TYPE:	CI	CERTIFICATION YEAR:	2007
INJECTOR TYPE:	EUI	PISTON SPD @ RATED ENG SPD (FT/MIN):	1,913.4
REF EXH STACK DIAMETER (IN):	8		
MAX OPERATING ALTITUDE (FT):	997		

INDUSTRY	SUB INDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

General Performance Data [Top](#)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)
EKW	%	BHP	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR
1,000.0	100	1,483	333	0.342	0.337	71.5	70.4
900.0	90	1,338	301	0.341	0.336	64.2	63.3
800.0	80	1,195	268	0.348	0.343	58.7	57.9
750.0	75	1,124	252	0.353	0.348	56.0	55.2
700.0	70	1,053	237	0.354	0.349	52.6	51.9
600.0	60	912	205	0.353	0.348	45.4	44.8
500.0	50	772	173	0.350	0.345	38.1	37.5
400.0	40	635	143	0.351	0.346	31.4	30.9
300.0	30	496	111	0.357	0.352	25.0	24.6
250.0	25	426	96	0.363	0.358	21.8	21.5
200.0	20	355	80	0.373	0.367	18.7	18.4
100.0	10	209	47	0.424	0.418	12.5	12.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,000.0	100	1,483	70.8	118.8	1,214.1	58.6	892.5	76	424.5
900.0	90	1,338	64.3	111.4	1,153.5	52.2	856.8	70	392.7
800.0	80	1,195	60.6	106.7	1,117.9	48.8	833.4	66	375.9
750.0	75	1,124	58.4	104.2	1,102.3	47.0	822.2	63	366.1
700.0	70	1,053	54.2	100.0	1,080.1	43.6	811.1	59	345.5
600.0	60	912	44.3	90.6	1,028.7	35.7	789.8	49	304.7
500.0	50	772	33.5	81.3	968.0	27.4	769.5	37	264.3
400.0	40	635	24.3	74.9	899.7	20.8	733.5	27	224.9
300.0	30	496	16.1	70.5	816.3	15.3	679.6	19	185.5
250.0	25	426	12.3	69.0	768.2	12.9	646.0	15	165.6
200.0	20	355	8.9	67.9	713.3	10.7	605.3	11	147.2
100.0	10	209	4.5	67.5	572.6	7.8	491.3	6	123.0

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,000.0	100	1,483	3,105.2	8,115.3	13,517.7	14,024.8	2,950.9	2,698.6
900.0	90	1,338	2,944.7	7,443.4	12,775.8	13,231.6	2,780.0	2,550.6
800.0	80	1,195	2,860.8	7,069.3	12,380.1	12,796.7	2,687.9	2,475.7
750.0	75	1,124	2,799.4	6,858.4	12,094.1	12,491.0	2,630.6	2,427.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
700.0	70	1,053	2,654.6	6,439.5	11,425.3	11,795.7	2,491.4	2,301.6
600.0	60	912	2,369.9	5,618.4	10,126.3	10,445.3	2,210.8	2,046.3
500.0	50	772	2,090.3	4,815.2	8,871.8	9,141.4	1,926.2	1,786.0
400.0	40	635	1,819.3	4,039.9	7,654.2	7,876.2	1,664.7	1,547.4
300.0	30	496	1,549.9	3,272.7	6,487.7	6,664.2	1,412.4	1,317.4
250.0	25	426	1,414.6	2,888.8	5,920.9	6,075.3	1,284.6	1,200.7
200.0	20	355	1,292.4	2,528.2	5,413.4	5,545.9	1,167.2	1,094.3
100.0	10	209	1,149.4	1,989.9	4,805.1	4,893.7	1,028.8	975.8

Heat Rejection Data

Top

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
1,000.0	100	1,483	20,153	7,292	58,664	32,275	8,277	16,551	62,887	155,406	165,547
900.0	90	1,338	18,470	6,522	52,678	28,324	7,440	14,394	56,743	139,692	148,807
800.0	80	1,195	16,970	5,949	49,043	26,036	6,799	13,345	50,677	127,654	135,984
750.0	75	1,124	16,223	6,124	47,027	24,781	6,486	12,683	47,666	121,777	129,723
700.0	70	1,053	15,326	6,876	43,772	22,824	6,093	11,231	44,653	114,394	121,858
600.0	60	912	13,529	6,786	37,588	19,231	5,263	8,681	38,675	98,811	105,259
500.0	50	772	11,822	5,357	31,812	16,013	4,411	6,504	32,735	82,825	88,230
400.0	40	635	10,869	4,421	25,935	12,562	3,637	4,598	26,908	68,277	72,732
300.0	30	496	9,934	3,738	20,129	9,084	2,892	2,986	21,049	54,294	57,837
250.0	25	426	9,352	3,463	17,322	7,412	2,525	2,290	18,081	47,414	50,508
200.0	20	355	8,620	3,178	14,651	5,809	2,162	1,718	15,065	40,584	43,232
100.0	10	209	6,683	2,334	9,950	2,795	1,444	1,067	8,853	27,118	28,888

Emissions Data

Top

Units Filter

All Units

▼

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	1,000.0	750.0	500.0	250.0	100.0
ENGINE POWER	BHP	1,483	1,124	772	426	209
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	7,256	4,250	2,777	1,877	1,108
TOTAL CO	G/HR	192	123	265	435	672
TOTAL HC	G/HR	19	55	53	40	80
TOTAL CO2	KG/HR	726	568	384	219	125
PART MATTER	G/HR	26.9	19.9	34.3	53.7	43.0
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,346.5	1,746.8	1,683.5	2,004.0	1,999.0
TOTAL CO	(CORR 5% O2) MG/NM3	62.1	49.6	159.5	470.0	1,358.8
TOTAL HC	(CORR 5% O2) MG/NM3	5.4	19.7	27.7	36.7	147.6
PART MATTER	(CORR 5% O2) MG/NM3	7.3	6.9	17.8	53.8	69.4
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,143	851	820	976	974
TOTAL CO	(CORR 5% O2) PPM	50	40	128	376	1,087
TOTAL HC	(CORR 5% O2) PPM	10	37	52	68	275
TOTAL NOX (AS NO2)	G/HP-HR	4.93	3.81	3.61	4.41	5.32
TOTAL CO	G/HP-HR	0.13	0.11	0.34	1.02	3.22
TOTAL HC	G/HP-HR	0.01	0.05	0.07	0.09	0.38
PART MATTER	G/HP-HR	0.02	0.02	0.04	0.13	0.21
TOTAL NOX (AS NO2)	LB/HR	16.00	9.37	6.12	4.14	2.44
TOTAL CO	LB/HR	0.42	0.27	0.58	0.96	1.48
TOTAL HC	LB/HR	0.04	0.12	0.12	0.09	0.18
TOTAL CO2	LB/HR	1,600	1,252	847	484	275
PART MATTER	LB/HR	0.06	0.04	0.08	0.12	0.09
OXYGEN IN EXH	%	10.0	11.4	12.2	13.4	15.7
DRY SMOKE OPACITY	%	0.7	0.7	1.3	3.0	2.2
BOSCH SMOKE NUMBER		0.18	0.16	0.57	1.30	1.00

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN	EKW	1,000.0	750.0	500.0	250.0	100.0
ENGINE POWER	BHP	1,483	1,124	772	426	209
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	8,780	5,143	3,360	2,272	1,341
TOTAL CO	G/HR	359	231	495	813	1,256
TOTAL HC	G/HR	36	104	100	76	151
PART MATTER	G/HR	52.5	38.7	66.9	104.7	83.8
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,839.3	2,113.6	2,037.0	2,424.8	2,418.8
TOTAL CO	(CORR 5% O2) MG/NM3	116.2	92.7	298.2	879.0	2,541.0
TOTAL HC	(CORR 5% O2) MG/NM3	10.2	37.3	52.3	69.3	278.9
PART MATTER	(CORR 5% O2) MG/NM3	14.2	13.4	34.8	104.9	135.3
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,383	1,030	992	1,181	1,178
TOTAL CO	(CORR 5% O2) PPM	93	74	239	703	2,033
TOTAL HC	(CORR 5% O2) PPM	19	70	98	129	521
TOTAL NOX (AS NO2)	G/HP-HR	5.97	4.60	4.37	5.34	6.43
TOTAL CO	G/HP-HR	0.24	0.21	0.64	1.91	6.03
TOTAL HC	G/HP-HR	0.02	0.09	0.13	0.18	0.73
PART MATTER	G/HP-HR	0.04	0.03	0.09	0.25	0.40
TOTAL NOX (AS NO2)	LB/HR	19.36	11.34	7.41	5.01	2.96

GENSET POWER WITH FAN	EKW	1,000.0	750.0	500.0	250.0	100.0
ENGINE POWER	BHP	1,483	1,124	772	426	209
PERCENT LOAD	%	100	75	50	25	10
TOTAL CO	LB/HR	0.79	0.51	1.09	1.79	2.77
TOTAL HC	LB/HR	0.08	0.23	0.22	0.17	0.33
PART MATTER	LB/HR	0.12	0.09	0.15	0.23	0.18

Regulatory Information [Top](#)

EPA TIER 2		2006 - 2010			
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.					
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR	
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20	

EPA EMERGENCY STATIONARY		2011 - ----			
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.					
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR	
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20	

Altitude Derate Data [Top](#)

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)										
AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	1,474	1,474	1,474	1,474	1,474	1,468	1,442	1,417	1,393	1,474
1,000	1,474	1,474	1,474	1,466	1,439	1,413	1,388	1,364	1,341	1,474
2,000	1,474	1,465	1,438	1,411	1,385	1,360	1,336	1,314	1,291	1,434
3,000	1,438	1,410	1,383	1,358	1,333	1,309	1,286	1,264	1,242	1,389
4,000	1,383	1,356	1,331	1,306	1,282	1,259	1,237	1,216	1,195	1,345
5,000	1,330	1,304	1,280	1,256	1,233	1,211	1,190	1,169	1,149	1,302
6,000	1,278	1,254	1,230	1,207	1,185	1,164	1,144	1,124	1,105	1,260
7,000	1,228	1,205	1,182	1,160	1,139	1,119	1,099	1,080	1,062	1,220
8,000	1,180	1,157	1,135	1,114	1,094	1,074	1,056	1,037	1,020	1,180
9,000	1,133	1,111	1,090	1,070	1,050	1,032	1,014	996	979	1,141
10,000	1,087	1,066	1,046	1,027	1,008	990	973	956	940	1,103
11,000	1,043	1,023	1,004	985	967	950	933	917	902	1,066
12,000	1,001	981	963	945	928	911	895	880	865	1,029
13,000	959	941	923	906	889	874	858	843	829	994
14,000	919	901	884	868	852	837	822	808	794	959
15,000	880	863	847	831	816	802	788	774	761	926

Cross Reference [Top](#)

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K8987	PP6050	2537557	GS277	-	SYC00001	
0K7838	GG0346	3208618	GS490	-	JDB00001	
0K8987	PP6050	3249750	GS277	-	SYC00001	
0K8987	PP6050	3367659	GS471	-	PRH00001	
0K8987	PP6050	3801431	GS471	-	PRH00001	
0K8987	PP6050	4391323	GS471	-	PRH03719	
0K8987	PP6050	4447558	GS471	-	PRH00001	
0K8987	PP6050	4447562	GS471	-	PRH00001	
0K8987	PP6050	5233431	GS471	-	PRH00001	
0K8987	PP6050	5612763	GS471	DK	PRH00001	
0K8987	PP6050	6034725	PG457	-	PRH00001	

Performance Parameter Reference [Top](#)

Parameters Reference: DM9600 - 14
PERFORMANCE DEFINITIONS
PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
On 3500 and C175 engines, at speeds below Peak Torque these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set. Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet. Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS: Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

WET & DRY EXHAUST/EMISSIONS DESCRIPTION: Wet - Total exhaust flow or concentration of total exhaust flow Dry - Total exhaust flow minus water vapor or concentration of exhaust flow with water vapor excluded

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

PACKAGE DATA [C32DRA0]

Feature Code:	C32DRA0	Rating Type:	STANDBY	Sales model Package:	V12 GCAG
Engine Sales Model:	C32	Engine Arrangement Number:	6034725	Hertz:	60
EKW W/F:	1000.0	Noise Reduction:	0 dBA	Back Pressure:	0.0 inH2O

Engine Package Information

Engine Package Data

Package Cooling Information

SA Level 2 Canopy Cooling Data					
% Load	Airflow Rate scfm	Ambient Capability Sea Level (Deg F)	Ambient Capability 300 m (Deg F)	Ambient Capability 600 m (Deg F)	Ambient Capability 900 m (Deg F)
100.0	35420	127	123	120	113

Package Sound Information

Sound Comments :

SA Level 2 Canopy Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	83.5	91.1	89.4	76.9	72.6	66.4	69.7	70.7
750.0	75.0	83.3	91.1	89.4	76.7	72.3	65.8	69.4	70.0
500.0	50.0	82.5	89.1	88.7	76.2	72.1	66.1	69.5	67.1
250.0	25.0	81.7	87.1	88.0	76.7	71.9	63.5	67.4	65.5

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	74.9	81.6	80.4	69.0	64.9	59.1	61.1	65.1
750.0	75.0	74.7	81.2	80.3	68.9	64.8	58.9	60.7	64.4
500.0	50.0	74.2	80.3	80.1	68.9	64.3	58.3	59.8	62.2
250.0	25.0	73.7	79.3	79.8	68.8	63.7	57.6	58.8	60.0

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	73.6	82.1	77.5	67.7	63.3	64.3	58.8	63.5
750.0	75.0	72.4	81.9	75.9	67.5	61.3	60.5	58.9	63.1
500.0	50.0	72.8	80.0	75.0	67.1	65.9	64.9	58.0	60.7
250.0	25.0	71.8	77.1	75.7	68.5	62.0	63.1	56.6	58.2

WP Canopy - Industrial Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	89.9	97.8	94.8	84.6	80.9	78.7	74.1	73.6
750.0	75.0	89.4	98.7	94.1	83.7	80.4	77.7	72.9	69.6
500.0	50.0	88.5	97.8	93.0	82.9	79.8	77.4	72.2	66.9
250.0	25.0	87.8	97.1	92.0	82.5	79.4	76.9	71.6	65.4

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	80.9	87.2	84.9	76.4	73.1	70.9	66.2	65.1
750.0	75.0	80.3	88.1	84.3	75.6	72.7	70.0	65.0	61.1
500.0	50.0	79.5	87.3	83.2	74.9	72.1	69.6	64.3	58.4
250.0	25.0	78.8	86.6	82.2	74.3	71.6	69.2	63.7	56.9

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	74.6	80.9	78.6	70.1	66.9	64.6	59.9	58.8
750.0	75.0	74.0	81.8	78.0	69.3	66.4	63.7	58.7	54.8
500.0	50.0	73.2	81.0	76.9	68.6	65.8	63.4	58.1	52.1
250.0	25.0	72.5	80.3	75.9	68.0	65.3	62.9	57.4	50.6

Open Exhaust Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	117.0	120.9	122.7	112.0	108.4	107.1	97.0	82.3
750.0	75.0	114.3	118.4	120.0	108.6	106.1	104.1	93.5	78.3
500.0	50.0	108.5	111.1	113.5	104.6	101.2	98.3	88.4	69.9
250.0	25.0	108.3	113.4	115.3	102.7	95.6	94.7	82.0	59.3

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	100.1	104.0	105.8	95.1	91.5	90.2	80.1	65.4
750.0	75.0	97.4	101.5	103.1	91.7	89.2	87.2	76.6	61.4
500.0	50.0	91.6	94.2	96.6	87.7	84.3	81.4	71.5	53.0
250.0	25.0	91.4	96.5	98.4	85.8	78.7	77.8	65.1	42.4

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	96.5	100.4	102.2	91.5	87.9	86.6	76.5	61.8
750.0	75.0	93.8	97.9	99.5	88.1	85.6	83.6	73.0	57.8
500.0	50.0	88.0	90.6	93.0	84.1	80.7	77.8	67.9	49.4
250.0	25.0	87.8	92.9	94.8	82.2	75.1	74.2	61.5	38.8

Open Mechanical Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	108.2	105.6	110.1	104.3	102.0	99.5	95.5	98.4
750.0	75.0	107.9	106.0	110.5	104.3	102.2	98.7	94.3	94.7
500.0	50.0	108.0	106.3	110.6	104.6	102.3	98.8	93.7	93.6
250.0	25.0	108.0	105.6	110.7	104.5	102.2	98.9	92.5	96.1

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	95.9	96.3	94.2	92.9	90.1	88.6	84.1	83.6
750.0	75.0	95.3	96.5	94.8	92.6	89.9	87.2	82.5	80.7
500.0	50.0	95.0	95.8	94.7	92.5	89.9	86.7	81.6	79.8
250.0	25.0	94.9	94.9	94.3	92.7	89.5	86.6	80.2	81.6

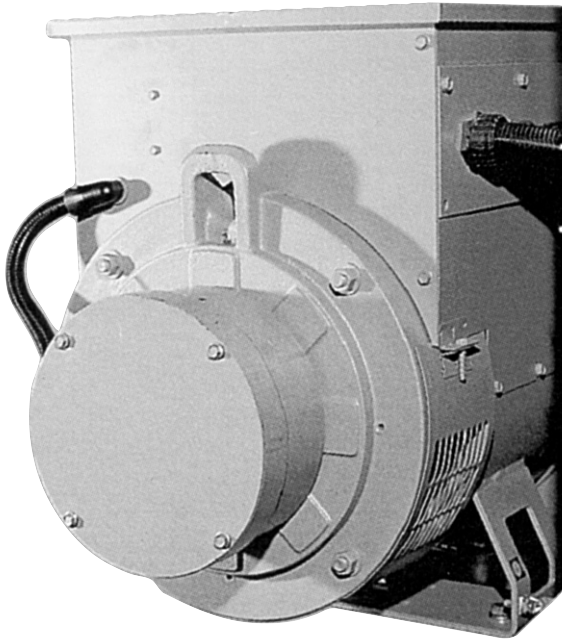
Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1000.0	100.0	93.1	92.4	95.1	89.2	86.3	85.8	81.0	79.2
750.0	75.0	92.3	92.5	95.0	88.9	85.5	84.3	79.4	76.5
500.0	50.0	91.7	92.7	95.1	88.3	84.2	83.2	78.2	76.0
250.0	25.0	91.6	94.2	95.9	88.3	83.7	81.9	75.8	77.5



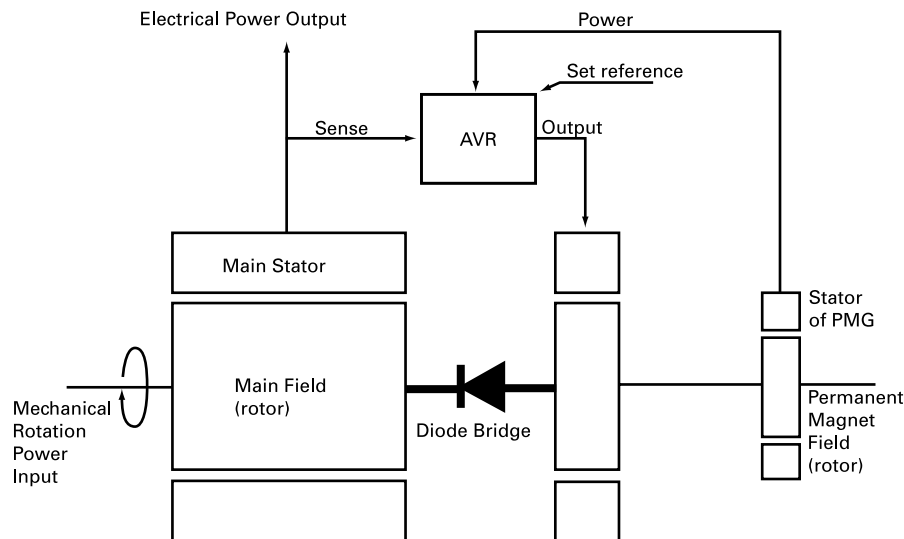
AIR INTAKE SYSTEM		
THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.		
MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH CLEAN ELEMENT	15	IN-H2O
MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH DIRTY ELEMENT	25	IN-H2O
MAXIMUM PRESSURE DROP FROM COMPRESSOR OUTLET TO MANIFOLD INLET (OR MIXER INLET FOR EGR)	4.4	IN-HG
MAXIMUM TURBO INLET AIR TEMPERATURE	122	DEG F
MAXIMUM AIR FILTER INLET AIR TEMPERATURE	122	DEG F
MAXIMUM ALLOWABLE STATIC WEIGHT ON AIR INLET	0	LB
MAXIMUM ALLOWABLE STATIC BENDING MOMENT ON AIR INLET	0	LB-FT
MAXIMUM ALLOWABLE STATIC WEIGHT ON TURBO OUTLET CONNECTION	0	LB
MAXIMUM ALLOWABLE STATIC BENDING MOMENT ON TURBO OUTLET CONNECTION	0	LB-FT
COOLING SYSTEM		
ENGINE ONLY COOLANT CAPACITY	14.5	GAL
MAXIMUM ALLOWABLE JACKET WATER OUTLET TEMPERATURE	210	DEG F
REGULATOR LOCATION FOR JW (HT) CIRCUIT	OUTLET	
MAXIMUM UNINTERRUPTED FILL RATE	5.0	G/MIN
MINIMUM COOLANT LOSS WITHOUT IMPACTING RADIATOR PERFORMANCE (PERCENT OF TOTAL)	12	PERCENT
COOLANT LOSS-MAXIMUM PERCENTAGE OF PUMP PRESSURE RISE LOSS	10	PERCENT
ENGINE SPEC SYSTEM		
CYLINDER ARRANGEMENT	VEE	
NUMBER OF CYLINDERS	12	
CYLINDER BORE DIAMETER	5.7	IN
PISTON STROKE	6.4	IN
TOTAL CYLINDER DISPLACEMENT	1959	CU IN
STANDARD CRANKSHAFT ROTATION FROM FLYWHEEL END	CCW	
STANDARD CYLINDER FIRING ORDER	1-10-9-6-5-12-11-4-3-8-7-2	
NUMBER 1 CYLINDER LOCATION	LEFT FRONT	
STROKES/COMBUSTION CYCLE	4	
EXHAUST SYSTEM		
THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.		
MAXIMUM ALLOWABLE SYSTEM BACK PRESSURE	27	IN-H2O
MANIFOLD TYPE	DRY	
MAXIMUM ALLOWABLE STATIC WEIGHT ON EXHAUST CONNECTION	110.2	LB
MAXIMUM ALLOWABLE STATIC BENDING MOMENT ON EXHAUST CONNECTION	0	LB-FT
FUEL SYSTEM		
MAXIMUM FUEL FLOW FROM TRANSFER PUMP TO ENGINE	221.9	G/HR
MAXIMUM ALLOWABLE FUEL SUPPLY LINE RESTRICTION	-8.9	IN-HG
MAXIMUM ALLOWABLE FUEL TEMPERATURE AT TRANSFER PUMP INLET	149	DEG F
MAXIMUM FUEL FLOW TO RETURN LINE FROM ENGINE	190.2	G/HR
MAXIMUM ALLOWABLE FUEL RETURN LINE RESTRICTION	10.2	IN-HG
NORMAL FUEL PRESSURE IN A CLEAN SYSTEM	90.9	PSI
FUEL SYSTEM TYPE	EUI	
MAXIMUM TRANSFER PUMP PRIMING LIFT WITHOUT PRIMING PUMP	12.1	FT
LUBE SYSTEM		
CRANKCASE VENTILATION TYPE	TO ATM	
MOUNTING SYSTEM		

CENTER OF GRAVITY LOCATION - X DIMENSION - FROM REAR FACE OF BLOCK - (REFERENCE TM7077)	23.0	IN
CENTER OF GRAVITY LOCATION - Y DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077)	11.5	IN
CENTER OF GRAVITY LOCATION - Z DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077)	0	IN
DRY WEIGHT - ENGINE ONLY (REFERENCE VALUE)	6462	LB
STARTING SYSTEM		
MINIMUM CRANKING SPEED REQUIRED FOR START	100	RPM
LOWEST AMBIENT START TEMPERATURE WITHOUT AIDS	32	DEG F



AVR12 – PERMANENT MAGNET GENERATOR

The permanent magnet generator (PMG) option upgrades the excitation system of the generator from the standard self-excited system to a separately-excited system. The PMG couples to the non-drive end of the generator and provides an independent source of excitation power that ensures initial voltage build-up. The PMG improves the voltage response of the generator during transient load application, such as motor starting, and provides a sustained short-circuit current for the operation of protective devices. Isolation of the excitation power ensures that regulation is not affected by non-linear distorting loads.



BLOCK DIAGRAM OF PMG

EXCITATION MODULE



EM10

The EM10 Excitation Module is a power electronics component designed to provide excitation current to the generator that is controlled by the Integrated Voltage Regulator (IVR) feature in the EMCP 4 controls.

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness.

FEATURES

- Over-excitation protection – limit can be adjusted via a potentiometer (IEXC.)
- Green status LED indicating unit is powered on
- Red status LED indicating excitation current limiting (flashing) or shutdown (solid)

When used with EMCP 4.3/4.4 and IVR-compatible EMCP 4.1/4.2 controllers, the Integrated Voltage Regulator system offers:

- Automatic Voltage Regulation (AVR)
- Programmable stability settings
- Soft start control with an adjustable time setting in AVR control mode
- Dual Slope Under Frequency (Volts / Hz) regulation
- Three-phase or single-phase generator voltage (RMS) sensing/regulation in AVR mode

EMCP 4.3/4.4 and IVR-compatible EMCP 4.2 controllers also offer:

- Power Factor Regulation (PF)
- Generator paralleling with reactive droop compensation
- Line drop compensation

WORLDWIDE PRODUCT SUPPORT

- Worldwide parts availability through the Cat® dealer network
- Over 1,800 dealer branch stores operating in 200 countries
- The best product support record in the industry
- Cat dealers provide extensive post sale support including maintenance and repair agreements

COMPLETE SYSTEM INTEGRATION

Fully designed and factory tested to work seamlessly with Cat generators using Self Excitation (SE), Internal Excitation (IE) or Permanent Magnet (PMG) excitation systems and EMCP controls.

EXCITATION MODULE – EM10



SPECIFICATIONS

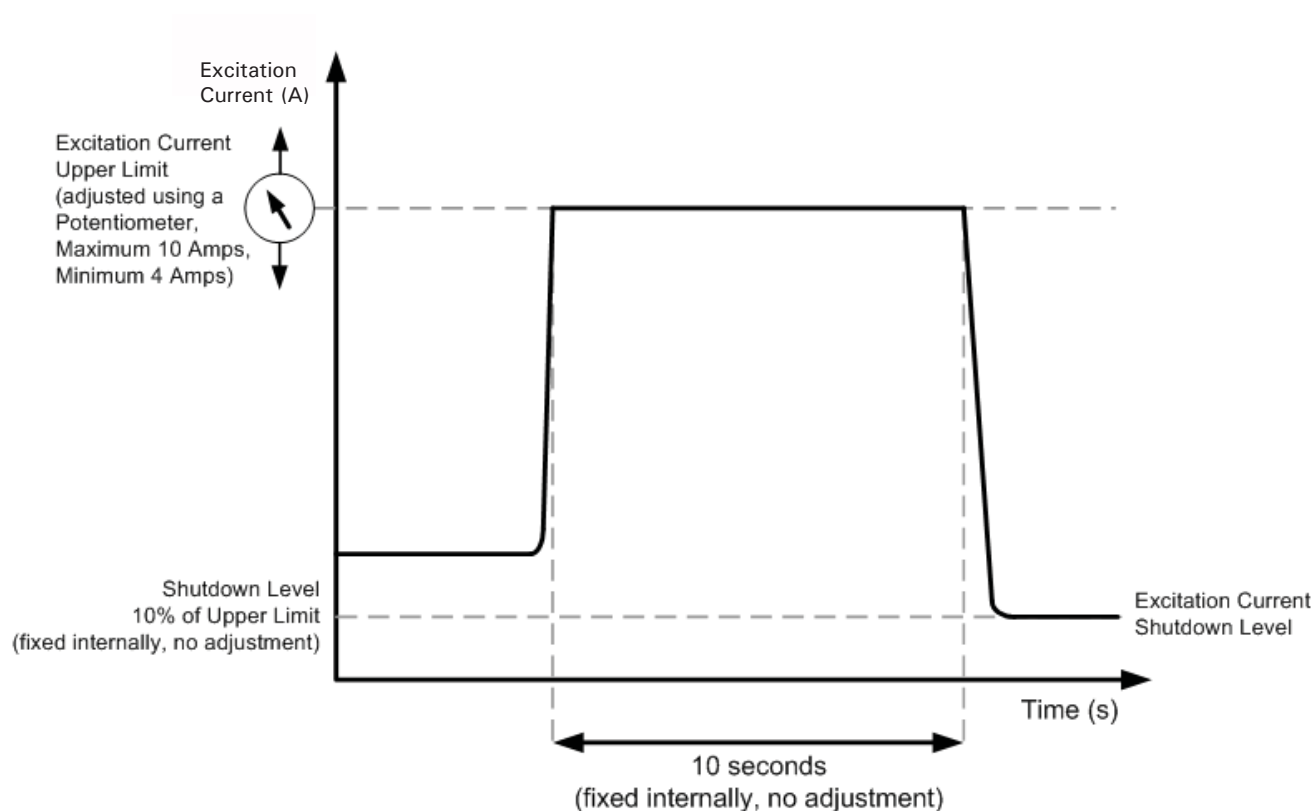
ELECTRICAL	
Generator Excitation Types	Self Excitation / Internal Excitation / Permanent Magnet (PMG)
Max. Continuous Field Current Output	6 Amps
Max. Forcing Field Current Output	10 Amps
Max. AC Voltage Input (X1:X2, Z1:Z2)	180 Vrms
ENVIRONMENTAL	
Operating Temperature Range	–40 °C (–40 °F) to +70 °C (+158 °F)
Storage Temperature Range	–40 °C (–40 °F) to +85 °C (+185 °F)
Relative Humidity Tolerance	95% non-condensing humidity
Salt Spray	5% salt (NaCl) solution for 120 hrs
Vibration	4.5 G-rms, 24-2000 Hz in 3 orthogonal planes
Electromagnetic Compatibility	RF Immunity (Radiated & Conducted) RF Emissions (Radiated & Conducted) Electrical Transients
Weight	770 g ± 30 g
Power Consumption (at Max. Continuous Rating)	<450 VA
CONFORMITY	
UL	UL Recognized (U.S. and Canada) File No. E334232
CE Integration Certificate	In conformity with the applicable requirements of the following Standards: EN 50178 EN 60204-1 EN 61000-6-2 EN 61000-6-4

EXCITATION MODULE – EM10



OVER-EXCITATION PROTECTION

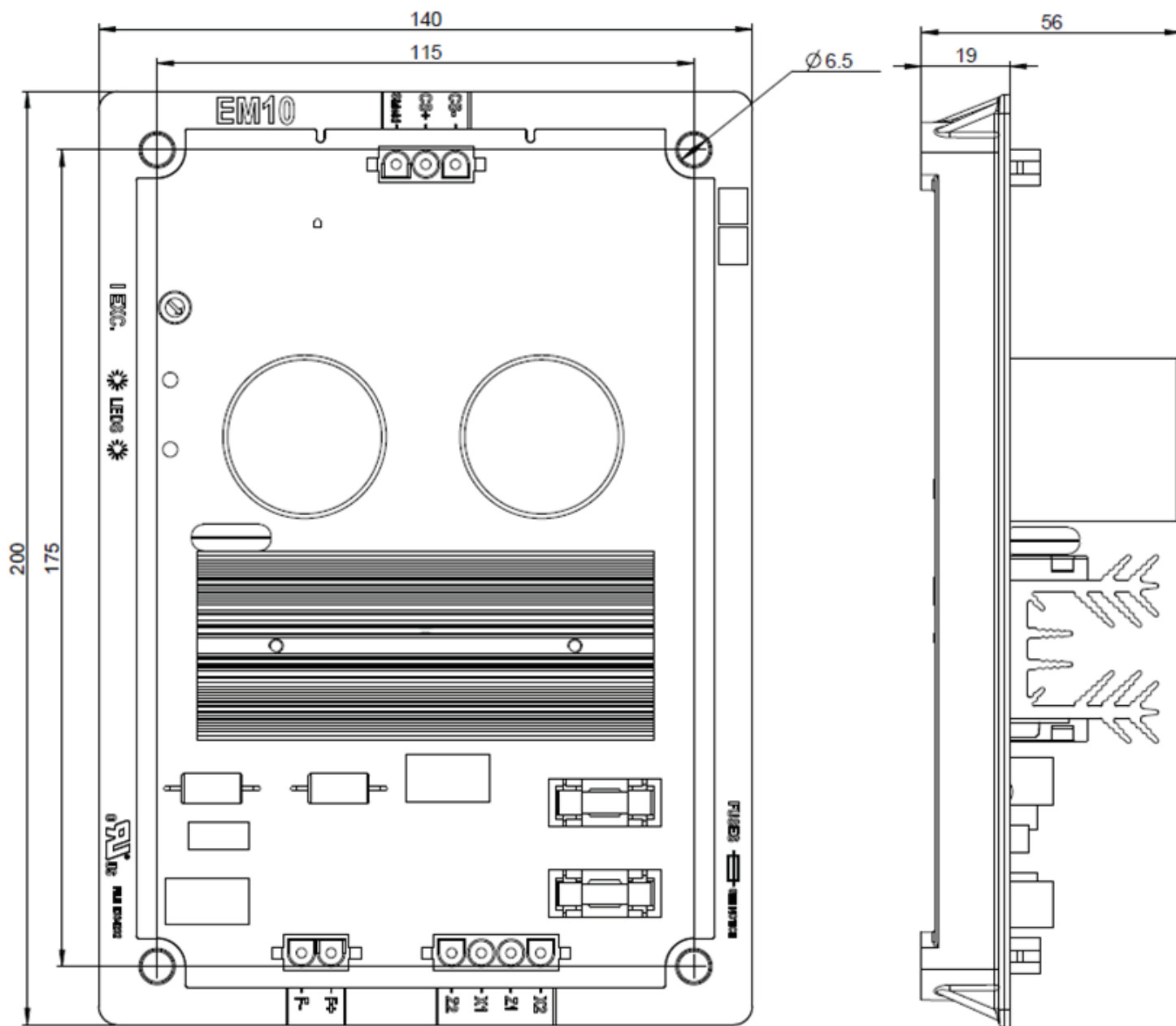
- If a short-circuit fault occurs at the generator terminals, the EM10 will allow the excitation current to rise to the upper limit value set by the adjustment potentiometer (max. 10 Amps).
- The excitation current will be clamped at the upper limit value for 10 seconds (fixed internally).
- After 10 seconds, the excitation current is reduced to a value of 10% of the potentiometer setting.



EXCITATION MODULE – EM10



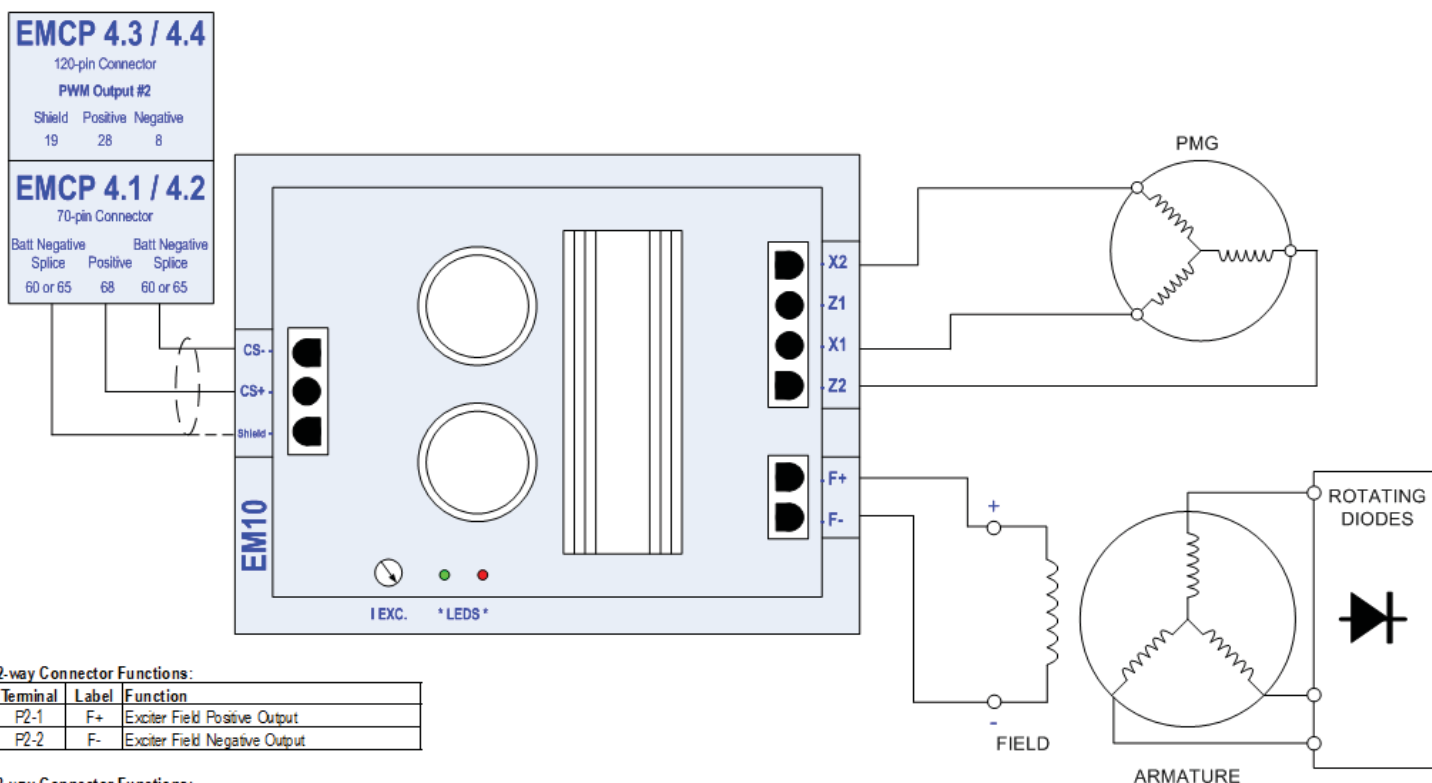
OUTLINE DRAWING (Dimensions in mm)



EXCITATION MODULE – EM10



EXAMPLE CONNECTION DIAGRAM (Permanent Magnet Excitation)



2-way Connector Functions:

Terminal	Label	Function
P2-1	F+	Exciter Field Positive Output
P2-2	F-	Exciter Field Negative Output

3-way Connector Functions:

Terminal	Label	Function
P3-1	Shield	Excitation Command Shield
P3-2	CS+	Excitation Command Positive Input
P3-3	CS-	Excitation Command Negative Input

4-way Connector Functions (PMG Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (PMG Phase B)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (PMG Phase A)
P4-4	Z2	Excitation Power Supply Input (PMG Phase C)

4-way Connector Functions (Self-Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (single-phase)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (single-phase)
P4-4	Z2	Not Connected

4-way Connector Functions (Internal Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (Aux Winding 1 - Positive)
P4-2	Z1	Excitation Power Supply Input (Aux Winding 2 - Positive)
P4-3	X1	Excitation Power Supply Input (Aux Winding 1 - Negative)
P4-4	Z2	Excitation Power Supply Input (Aux Winding 2 - Negative)

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Materials and specifications are subject to change without notice.

The International System of Units (SI) is used in this publication.

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ADEM™ A4 Engine Controller

The ADEM™ A4 is the main Electronic Control Module (ECM) used on select diesel engines. The ADEM A4 provides a higher degree of control over a large number of combustion variables. The ADEM A4 is designed to control/ interface Electronic Unit Injector (EUI) equipped engines. The ADEM A4 engine system is composed of the ADEM A4 ECM, control software, sensors, actuators, fuel injectors, and interface to the generator system. The prime benefit of an ADEM A4 engine system is to better control and maintain the particulate emissions, both steady state and transient, while improving engine performance



FEATURES

RELIABLE, DURABLE

All ADEM A4 controllers are designed to survive the harshest environments.

- Environmentally sealed, die-cast aluminum housing isolates and protects electronic components from moisture and dirt contamination.
- Rigorous vibration testing ensures product reliability and durability.
- Accuracy maintained from -40°C to 85°C
- Electrical noise immunity to 100 volts/meter
- Internal circuits are designed to withstand shorts to +battery and -battery.

SIMPLE SERVICING

Each ADEM A4 system works in combination with the Cat® ET service tool software to keep the engine operating at peak performance.

- Displays measured parameters
- Retrieves active and logged event code documenting abnormal system operation
- Performs calibrations and diagnostic tests
- Supports flash programming of new software into the ADEM A4 ECM

SELF DIAGNOSTICS

Each ADEM A4 ECM has a full compliment of diagnostics. The ECM can detect faults in the electrical system and report those faults to the service technician for quick repair.

- Self-diagnostic capability pinpoints operational problems in need of attention.

ADVANCED FEATURES

- Enhanced performance from fuel injection timing and limiting
- Adjustable monitoring of vital engine parameters
- Programmable speed acceleration ramp rate
- Data link interfaces

DESCRIPTION

The ECM is housed in an environmentally sealed casting. All wiring connections to the ECM are made using two sealed connectors: a single seventy-pin connector and a single one hundred twenty-pin connector.

ENGINE SPEED GOVERNING

Desired engine speed is calculated by the ECM and held within ± 0.2 Hz for isochronous and droop mode. The ECM accounts for droop that is requested. The proper amount of fuel is sent to the injectors due to these calculations. The ECM also employs cooldown/shutdown strategies, acceleration delays on startup, acceleration ramp times and speed reference.

FUEL LIMITING

Warm and cold fuel-air ratio control limits are controlled by the ECM. Electronic monitoring system derates, torque limit, and cranking limit, programmable torque scaling, and cold cylinder cutout mode are standard features.

FUEL INJECTION TIMING

Master timing for injection is controlled by the ECM control. Temperature dependencies are accounted for in the fuel injection calculations.

ELECTRONIC MONITORING

Electronic monitoring of vital engine parameters can be programmed. Warning, derate, and shutdown event conditions may be customized by the user.

INFORMATION MANAGEMENT

The ECM stores information to assist with electronic troubleshooting. Active and logged diagnostic codes, active events, logged events, fuel consumption, engine hours, and instantaneous totals aid service technicians when diagnosing electronic faults and scheduling preventive maintenance.

CALIBRATIONS

Engine performance is optimized through injection timing. Auto/manual sensor calibrations are standard features.

ON-BOARD SYSTEM TESTS

System tests are available to assist in electronic troubleshooting. These tests include: injector activation, injector cutout, and override of control outputs.

DATA LINK INTERFACES

The ADEM A4 communicates with the EMCP via a dedicated communication network.

ELECTRONIC SENSING

The following sensing is available on the ADEM A4: oil pressure, fuel pressure, fuel temperature, atmospheric pressure, air inlet temperature, turbo outlet pressure, engine coolant temperature, engine speed, throttle position, exhaust temperature, oil filter pressure differential, fuel filter pressure differential, air filter pressure differential and crankcase pressure.

SPECIFICATIONS

Impervious to:

salt spray, fuel, oil and oil additives, coolant,
spray cleaners, chlorinated solvents, hydrogen
sulfide and methane gas, and dust

Input and output protection

all inputs and outputs are protected against
short circuits to + battery and -battery

Input voltage range (24 VDC nominal)

18 to 32 VDC

Mounting

engine mounted

Reverse polarity protected

Shock, withstands 20 g

Temperature range

Operating: -40° C to 85° C (-40° F to 185° F)
Storage: -50° C to 120° C (-58° F to 248° F)

Vibration

withstands 8.0 g @ 24 to 2 kHz



Image shown might not reflect actual configuration

GCCP 1.2 - Control Panel

GCCP 1.2 is an auto Start Control Module suitable for a wide variety of diesel gen-set applications. Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the backlit LCD screen, illuminated LEDs and remote PC.

FEATURES

- 4-line back-lit LCD text display
- Multiple display languages
- Five-key menu navigation
- LCD alarm indication
- Customisable power-up text and images
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3-phase generator sensing and protection
- Generator current and power monitoring (kW, kvar, kVA, pf)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs (3 available for Customer use)
- 8 configurable digital outputs (5 available for Customer use)
- 4 configurable analogue inputs (3 available for Customer Use)
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- 3 configurable maintenance alarms

BENEFITS

- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.
- RS485 Communication port can be used for the Remote Monitoring Communication (Compatible with Cat PLG)

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING

8 V to 35 V Continuous
5 V for upto 1 minute

CRANKING DROPOUTS

Able to survive 0 V for 100 ms, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries.

LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT

260 mA at 12 V, 150 mA at 24 V

MAXIMUM STANDBY CURRENT

145 mA at 12 V, 85 mA at 24 V

CHARGE FAIL/EXCITATION RANGE

0 V to 35 V

GENERATOR & MAINS (UTILITY) VOLTAGE RANGE

15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE

3.5 Hz to 75 Hz

MAGNETIC PICKUP VOLTAGE RANGE

+/- 0.5 V to 70 V

FREQUENCY RANGE

10,000 Hz (max)

INPUTS

DIGITAL INPUTS A TO H

Negative switching

ANALOGUE INPUTS A & D

Configurable as:

Negative switching digital input 0 V to 10 V sensor
4 mA to 20 mA sensor Resistive sensor

ANALOGUE INPUTS B & C

Configurable as:

Negative switching digital input Resistive sensor

OUTPUTS

OUTPUT A & B (FUEL & START)

15 A DC at supply voltage

AUXILIARY OUTPUTS C, D, E, F, G & H

2 A DC at supply voltage

DIMENSIONS OVERALL

216 mm x 158 mm x 43 mm
8.5" x 6.2" x 1.5"

PANEL CUT-OUT

184 mm x 137 mm
7.2" x 5.3"

MAXIMUM PANEL THICKNESS

8 mm
0.3"

STORAGE TEMPERATURE RANGE

-40°C to +85°C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE

-30°C to +70°C
-22 °F to +158 °F

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2

ACCESSORIES



Picture shown may not reflect actual configuration

Features

- Moisture and fungus protection
- Clear indication of breaker status
- Reinforced insulation
- Shunt trip
- Auxiliary contacts
- Load side extension bars
- Maintenance-free operation
- Exceptional characteristics under short-circuit conditions
- Adjustable trip settings

NS-Frame

- Federal Specification W-C-375B/GEN
- NEMA AB1
- UTE, VDE, BS, CEI, UNE

Molded Case and Insulated Case Circuit Breakers:

C27-C175 North America built packages (50/60Hz)

L-Frame

400A (UL)

P-Frame

800-1200A (UL)

R-Frame

1600-3000A (UL)

NS-Frame

1600-3200A (IEC)

NW-Frame

1200-5000A (UL), 1600-5000A (IEC)

Conformity with International Standards

Circuit Breakers have been designed to comply with the international standard IEC 60947-2 as well as these other major standards:

L-Frame

UL 489

CSA 22.2 No 5

Federal Specification W-C-375B/GEN

NEMA AB1

NMX J-266

CCC

CE Marking

P-Frame & R-Frame

UL 489

IEC Standard 60947-2

CSA 22.2 No 5-02

Federal Specification W-C-375B/GEN

NEMA AB1

NMX J-266

UTE, VDE, BS, CEI, UNE

NW-Frame

UL 489

NEMA AB1

CSA 22.2 No. 5096

NMX J-266-ANCE

ANSI C37.13, C37.16, C37.17, C37.50

UL 1066 (cULus Listed)

NEMA SG3

Standard Features

Standards

- UL-CSA
 - L-Frame
 - P-Frame
 - R-Frame
 - NW-Frame
- IEC
 - NS-Frame

Shunt trip

- The shunt trip provides a means of tripping the circuit breaker electronically
- Shunt trip ratings
- Voltage: 24VDC
- Coil Burden (Holding/Inrush): 4.5/200 VA
- Power Consumption: 4.5 VA

Auxiliary contacts

The auxiliary contacts provide a means of remote circuit breaker position indication and consists of (1) Form C Contact (1 Normally open and 1 Normally closed contact) with the following current ratings:
6A @ 240-480 VAC, 50/60Hz

Trip units

All circuit breakers come equipped with True RMS Current Sensing.
The trip units for each of the circuit breaker ratings sample the current waveform to provide true RMS protection through the 15th harmonic. This true RMS sensing gives accurate values for the magnitude of a nonsinusoidal waveform. Therefore, the heating effects of harmonically distorted waveforms are accurately evaluated. The trip system comes equipped with a set of current transformers (CT's) to sense current, a trip unit to evaluate the current, and a tripping solenoid to trip the circuit breaker. Additionally, each trip unit comes equipped with Active Thermal Imaging which is active 20 minutes before and after tripping.

Customer cable connections

Connections include bus for installation flexibility.

Optional Features

Electrically-operated Circuit Breakers

Circuit breakers that are electrically-operated come with a two-step stored energy mechanism and come standard with a motor assembly. Motor assemblies provide on and off control from remote locations. These assemblies contain a spring-charging motor, a shunt trip, and shunt close. Motor Assembly Voltage Rating: 24-30VDC

Undervoltage trip

Undervoltage trip option trips the circuit breaker when the voltage drops to a value between 35% and 70% of the control voltage. An attempt to close the circuit breaker when the UV is not energized produces no movement in the main contacts. Closing is allowed when the supply voltage of the UV trip reaches 85% of the rated voltage.

- Voltage Rating: 24-30VAC/VDC
- Operating Threshold:
 - Opening: 0.35 to 0.7Vn
 - Closing: 0.85 Vn
- Power Consumption: 4.5VA
- Circuit Breaker Response Time at Vn: 50ms +/- 10

Circuit Breakers Table (Continued)

Cat® Part Number	Frame and Rating (Amps)	IEC/UL	No. Poles	Operation	Trip Unit	Circuit Breaker Characteristics	Options	Instantaneous Override (kA RMS) +/- 10%
449795	2000A NS2000 MCCB	IEC	3P	MO	6.0P LSIG-P	Table 4	1 Aux Contact, Shunt Trip, Modbus	–
2449800	2000A NS2000 MCCB	IEC	4P	MO	5.0A LSI	Table 4	1 Aux Contact, Shunt Trip	–
2449803	2000A NS2000 MCCB	IEC	4P	MO	6.0P LSIG-P	Table 4	1 Aux Contact, Shunt Trip, Modbus	24
2449868	2000AR-Frame MCCB	UL	3P	MO	5.0A LSI	Table 6	1 Aux Contact, Shunt Trip	57
2449869	2000A R-Frame MCCB	UL	3P	MO	6.0A LSIG	Table 6	1 Aux Contact, Shunt Trip	57
2449874	2000A NW-Frame ICCB	IEC	3P	EO	5.0A LSI	Table 5	4 Aux Contact, Shunt Trip	40
2449875	2000A NW-Frame ICCB	IEC	3P	EO	6.0A LSIG	Table 5	4 Aux Contact, Shunt Trip	40
2449876	2000A NW-Frame ICCB	IEC	3P	EO	6.0P LSIG-P	Table 5	4 Aux Contact, Shunt Trip, Modbus	40
2449877	2000A NW-Frame ICCB	IEC	4P	EO	5.0A LSI	Table 5	4 Aux Contact, Shunt Trip	–
2449878	2000A NW-Frame ICCB	IEC	4P	EO	6.0A LSIG	Table 5	4 Aux Contact, Shunt Trip	–
2449879	2000A NW-Frame ICCB	IEC	4P	EO	6.0P LSIG-P	Table 5	4 Aux Contact, Shunt Trip, Modbus	–
2449880	2000A NW-Frame ICCB	UL	3P	EO	5.0A LSI	Table 7	4 Aux Contact, Shunt Trip	40

Circuit Breakers Characteristics (Continued)

Model			R-Frame
Number of Poles			3
Rated Current (Amps)			1600-3000A (UL)
Voltage Rating (VAC)			600UL/ 690 IEC
Interrupt Rating (UL/CSA) (60Hz) - kA RMS		240V	65
		480V	35
		600V	18
IEC 60947-2 Rating (50/60Hz) - kA RMS	Icu	240V	50
		380/415V	35
	Ics	240V	25
		380/415V	20

Table 6

Model		NW-Frame
Number of Poles		3 & 4
Rated Current (Amps)		1200-2000A (UL)
Voltage Rating (VAC)		600UL
Interrupt Rating (UL/CSA) (60Hz) - kA RMS	240V	65
	480V	65
	600V	50

Table 7

Model		NW-Frame
Number of Poles		3 & 4
Rated Current (Amps)		2500-5000A (UL)
Voltage Rating (VAC)		600UL
Interrupt Rating (UL/CSA) (60Hz) - kA RMS	240V	100
	480V	100
	600V	85

Table 8

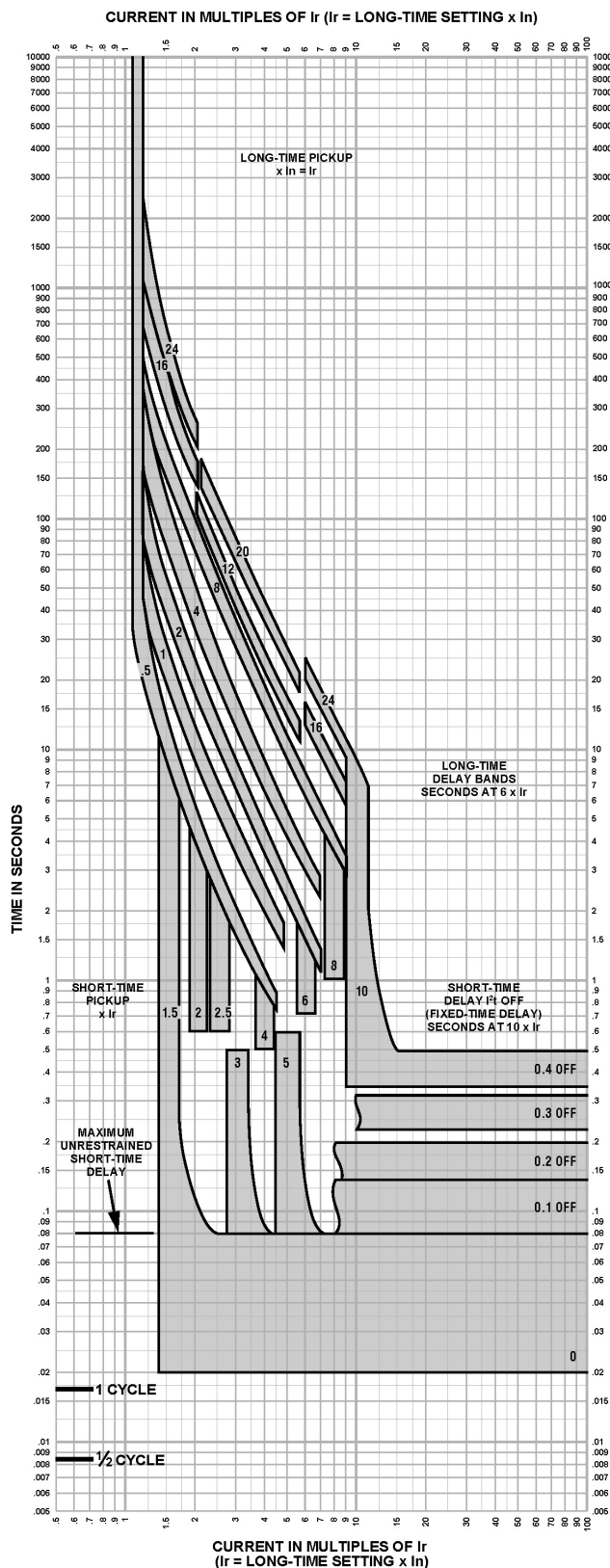
Model		R-Frame	
Number of Poles		3	
Rated Current (Amps)		1600-3000A (UL)	
Voltage Rating (VAC)		600UL/ 690 IEC	
Interrupt Rating (UL/CSA) (60Hz) - kA RMS	240V	100	
	480V	65	
	600V	25	
IEC 647-2 Rating (50/60Hz) - kA RMS	Icu	240V	65
		380/415V	50
	Ics	240V	35
		380/415V	25

Table 9

Model		L-Frame	
Number of Poles		3	
Rated Current (Amps)		400A (UL)	
Voltage Rating (VAC)		600UL/ 525 IEC	
Interrupt Rating (UL/CSA) (60Hz) - kA RMS	240V	65	
	480V	35	
	600V	18	
IEC 647-2 Rating (50/60Hz) - kA RMS	Icu	240V	65
		380/415V	35
	Ics	220V	65
		380/415V	35

Table 10

P, R, NS-Frame Long-Short Trip Curve and NW-Frame Long-Short Trip Curve



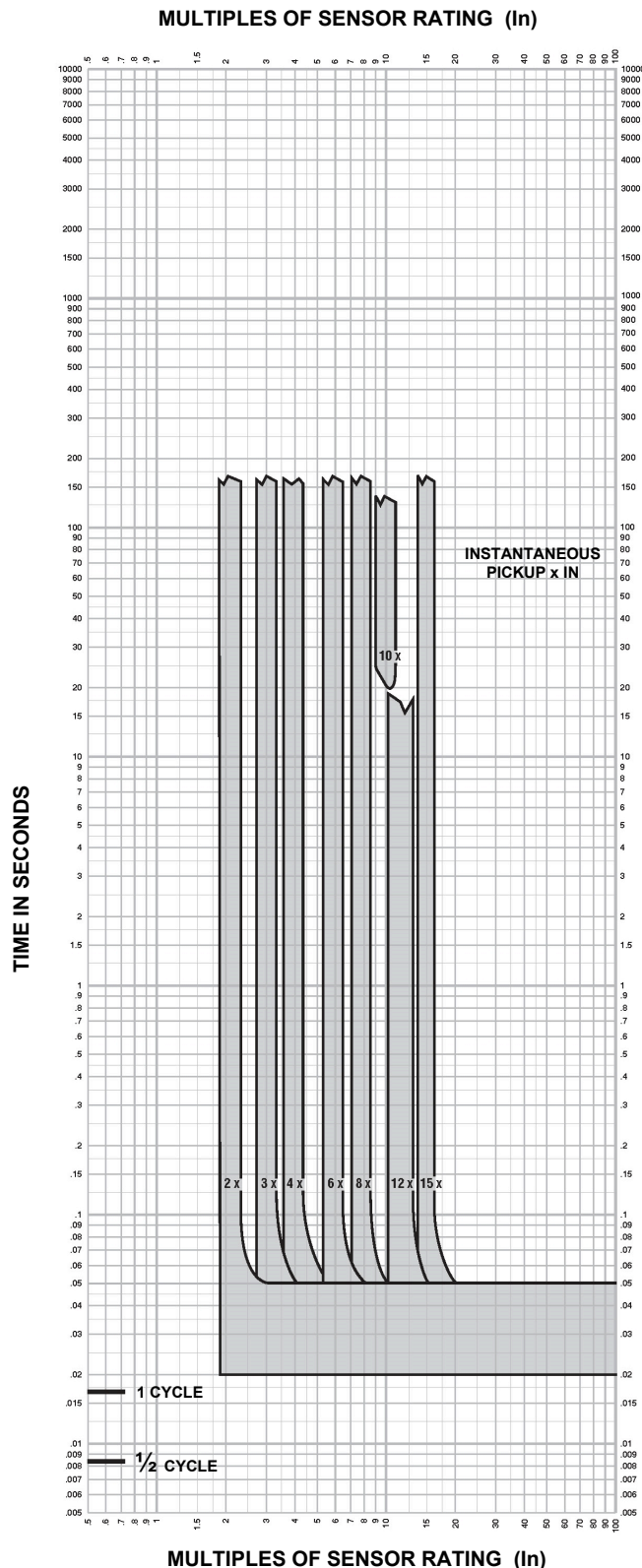
Long-time Pickup and Delay Short-time Pickup and I^2t OFF Delay

The time-current curve information is to be used for application and coordination purposes only. Curves apply from -30°C to $+60^{\circ}\text{C}$ ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermalimaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking on, short-time delay utilized and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF. See Page 22 for instantaneous trip curve. See tables on pages 03-18 for instantaneous override values..
6. Overload indicator illuminates at 100%.

P, R, NS-Frame Instant Curve and NW-Frame Instant Trip Curve



Instantaneous Pickup 2x–15x and OFF

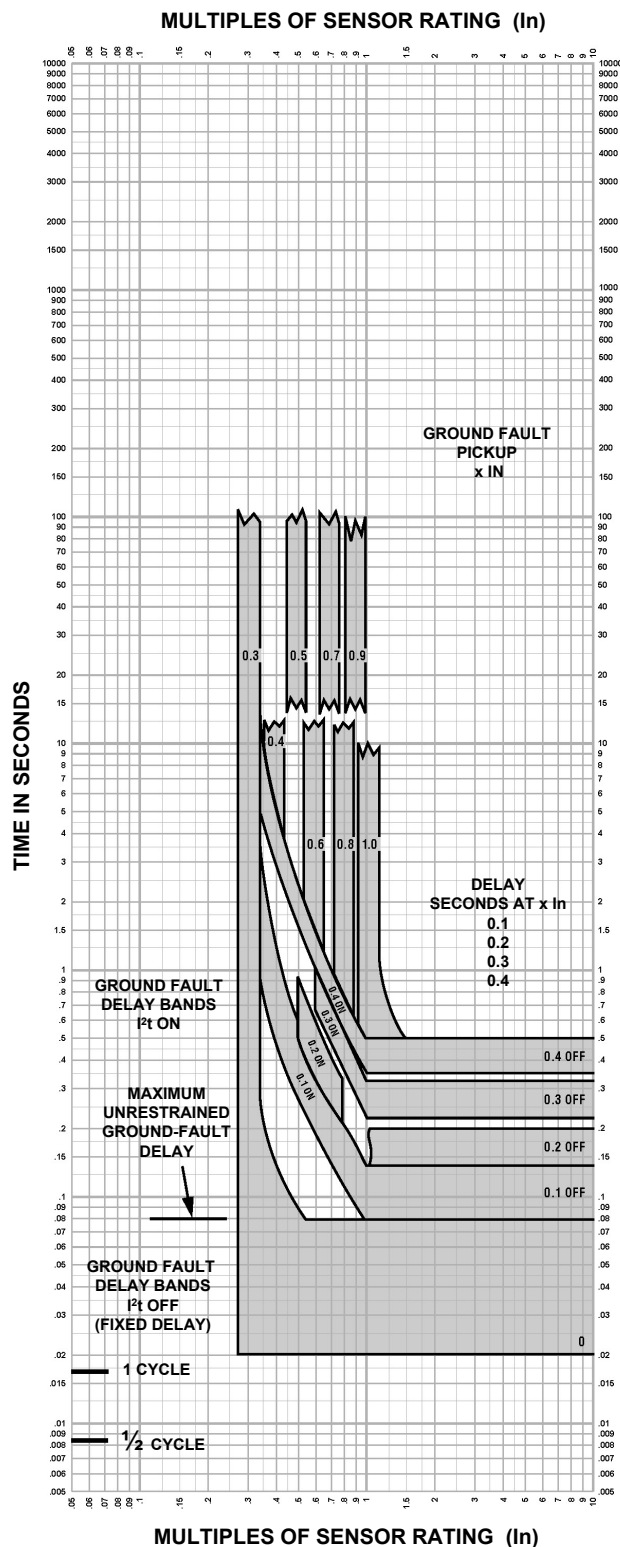
The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -30° to $+60^{\circ}\text{C}$ ambient temperature.

Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated. Contact your local Sales Office for additional information.
4. For a withstand circuit breaker, instantaneous can be turned OFF. See tables on pages 03-18 for instantaneous override values.
5. See page 22 for long-time pickup, long-time delay, short-time pickup, and short time delay trip curves.

P, R, NS-Frame Ground Curve and NW-Frame Ground Fault Trip Curve



Ground-fault I^2t OFF and ON $I_n \leq 400$ A

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -30°C to $+60^\circ\text{C}$ ambient temperature.

Materials and specifications are subject to change without notice.

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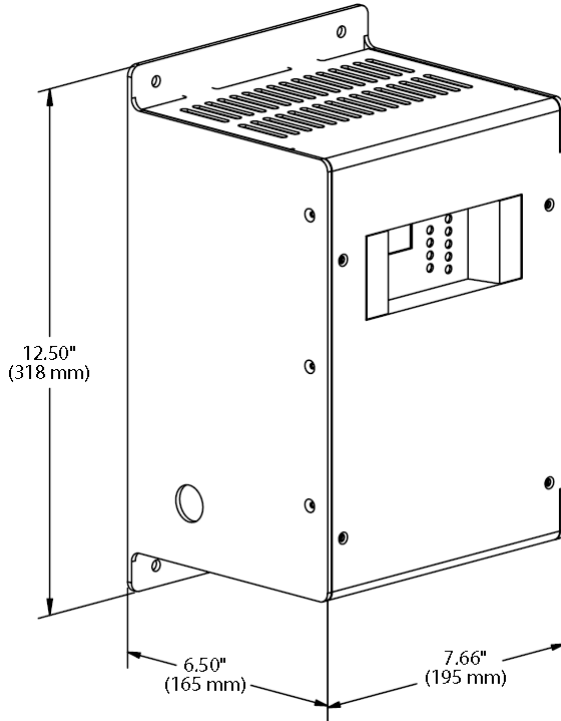


Image Shown may not Reflect Actual Package

UL 10 AMP BATTERY CHARGER

This battery charger offers accurate, automatic charging of lead-acid and nickel cadmium batteries. The output voltage automatically adjusts to changing input, load, battery and ambient conditions. This prevents battery over-charging and consequent loss of battery electrolyte.

Standard features include AC line compensation, precision voltage regulation, current limiting, automatic 2-rate charging, voltmeter and ammeter, temperature compensation and UL Listing.

The user interface is easy to understand with digital metering, NFPA 110 alarms and a battery fault alarm.

SPECIFICATION

Input Supply	110-120 V
	208-240 V
AC and DC Fuses	2 input and 2 output)
Output voltage	24V
Frequency	50/60 Hz
Operating temperature	-20°C (-4°F) to +60°C (140°F)

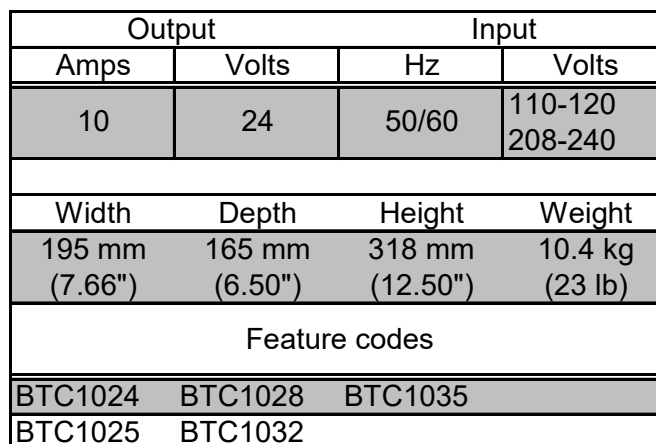
Housing constructed of rustproof anodized aluminum.

STANDARDS

- C-UL listed to UL 1236
- NFPA 70, NFPA 110
- CSA 22.2 No 107 certified
- UL 1564
- CE DOC to EN 60335
- IBC Seismic Certification

FEATURES

- Electronically current limited at 105% of rated output
- Alarm system
- Digital Display
- Lightning and voltage transient protection
- Protection of connected equipment against load dump protection
- Constant voltage, current limited, 4-rate automatic equalization
- IP 20 housing
- AC isolated from DC
- Temperature Compensation
 - On board temperature sensor with remote port
- Auto AC line compensation
- Output regulated by sensed battery voltage



▪ AC on	Green led (indication)
▪ AC fail	Red led and form C contact (2A)
▪ Float mode	LED
▪ Fast charge	LED
▪ Temp comp active	LED
▪ Low battery volts	Red led and Form C contact
▪ High Battery Volts	Red led and Form C contact
▪ Charger fail	Red led and Form C contact
▪ Battery fault	Red led and Form C contact
- Battery disconnected	
- Battery polarity reversed	
- Mismatched charger battery voltage	
- Open or high resistance charger to battery connection	
- Open battery cell or excessive internal resistance	

Page 226 of 1460

Cat® Batteries



Cat® Batteries—Greater Starting Power— Lower Maintenance—Longer Life

Cat Premium High Output (PHO) batteries are used in all Cat Machines and Engine Gen-Sets. They are designed to meet stringent Caterpillar design specifications, which provide industry leading cold cranking amps (CCA) capability and maximum vibration resistance.

Maintenance Free Accessible or low maintenance designs are available in wet and dry configurations.

General Service Line batteries are available in Maintenance Free Accessible or low maintenance designs. Wide selections of BCI group sizes are available for automotive, light truck, bus, industrial, agricultural, marine, recreational and valve regulated (VRLA-AGM & Gel) applications.



World's Toughest Batteries



Premium High Output—Maximum Vibration Resistance

- Vibration Resistance...five times the Industry Standard
- Exclusive "flat top" BCI group 4D & 8D batteries are Maintenance Free Accessible and have the industries highest cold cranking amps (CCA)
- Popular BCI group 31 Maintenance Free Accessible batteries with industry leading cold cranking amps...up to 1000 (CCA), for electric power, machine or on-highway truck and bus applications. Deep cycle models are available for truck, marine or recreational usage

Specifications for Cat Premium High Output Batteries-Available Worldwide

BCI Group Size	Part No.	CCA ≈	RC Mins †	Volts	Amp Hr. Capacity @ 20 Hrs.	Construction Notes	Accessibility - Fluid Level Check Hours	Length In (mm)	BCI Overall Dimensions		Nominal Weight		
									Width In (mm)	Height In (mm)	Wet Lb (kg)	Dry Lb (kg)	Nominal Acid to Fill Qt (liter)
8D	153-5720	1500	465	12	210	C/MFA	A - 1000	20.5 (520)	10.8 (275)	9.8 (248)	132 (59.9)	-	-
8D	101-4000	1400	400	12	190	LAC+	A - 1000	20.8 (527)	11.0 (278)	9.8 (248)	132 (59.9)	86 (39.0)	18.0 (17.0)
4D	153-5710	1400	425	12	200	C/MFA	A - 1000	20.5 (520)	8.6 (218)	9.8 (248)	119 (54.0)	-	-
4D	9X-9730	1300	400	12	190	LAC+	A - 1000	20.8 (527)	8.6 (218)	9.8 (248)	120 (54.0)	81 (36.8)	14.8 (14.0)
4D	153-5700	1125	305	12	145	C/MFA	A - 1000	20.5 (520)	8.6 (218)	9.8 (248)	101 (45.8)	-	-
4D	9X-9720	1000	275	12	140	LAC+	A - 1000	20.8 (527)	8.6 (218)	9.8 (248)	102 (45.8)	59 (26.8)	15.9 (15.0)
31	175-4390	1000	180	12	90	C/MFA/S	A - 1000	12.9 (329)	6.8 (172)	9.3 (236)	60 (27.2)	-	-
31	175-4370	825	190	12	100	C/MFA/S**	A - 1000	12.9 (329)	6.8 (172)	9.3 (236)	61 (27.2)	-	-
31	175-4360	710	185	12	100	C/MFA/S***	A - 1000	12.9 (329)	6.8 (172)	9.3 (236)	62 (28.1)	-	-
31/30H	115-2422	1000	170	12	90	C/MFA	A - 1000	12.9 (329)	6.8 (172)	9.5 (241)	63 (28.6)	-	-
31/30H	115-2421	950	170	12	90	C/MFA+	A - 1000	12.9 (329)	6.8 (172)	9.5 (241)	64 (29.1)	44 (20.0)	6.6 (6.2)
31/30H	9X-3404(1)	950	165	12	95/100	C/MF	NA	13.0 (331)	6.8 (172)	9.5 (241)	58 (26.3)	-	-
31/30H	3T-5760	750	165	12	95/100	C/MF	AV - 1000	13.0 (331)	6.8 (172)	9.5 (241)	56 (25.4)	-	-
65	230-6368	880	140	12	70	C/MF	NA	11.9 (304)	7.5 (191)	7.5 (191)	46 (20.9)	-	-
24	153-5656	650	110	12	52	C/MF	NA	11.0 (279)	6.9 (174)	9.0 (229)	39 (17.7)	-	-

Construction Notes:

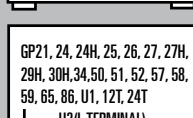
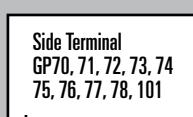
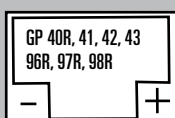
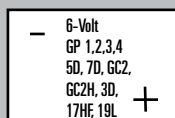
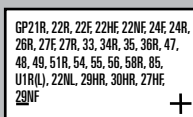
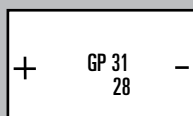
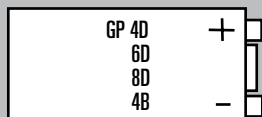
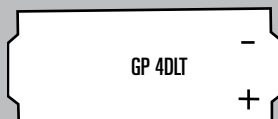
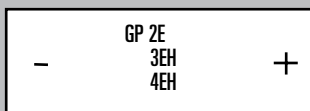
Batteries use SAE taper post design and are shipped wet except as:

- LAC = Low Maintenance - Hybrid Construction
- C = Calcium Lead Alloy Grid Design
- MF = Maintenance Free Non-Accessible
- MFA = Maintenance Free Accessible
- A = Accessible
- NA = Non-Accessible
- AV = Accessibly Varies - Accessibility varies depending on supplier used. If it has caps, it is accessible and fluid levels should be checked.
- S = Stud Terminals
- + = Shipped Dry Only
- * = Side Terminals Only
- ** = Starting and Deep Cycle Battery
- *** = Deep Cycle and Starting Battery
- ≈ = Cold Cranking Amps for 30 seconds at 0° F (-18° C)
- † = Reserve Capacity Minutes minimum of 25 amp output at 80° F (27° C)
- SDT = Dual, Top mounted Terminals - Stud and SAE Post. Marine Deep Cycle/Starting Battery
- 1 = Available in EAME and China only

Rugged Design—Built Tough—Reliable Starting

- Positive and negative plates are anchored to container bottom and locked at the top of cell element for maximum vibration resistance.
- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage.
- Hefty full-frame grids, no sharp edges, optimum acid/paste combination provides better charge acceptance after deep discharge.
- Manifold vented cover with built-in Flame Arrestor...a safety feature that directs corrosive gases away from the battery and hold-downs.
- Thick, robust container resists rugged treatment typical of heavy-duty commercial use. Embossed part number & descriptors for easy serviceability.

BCI Terminal Locations



Transit Bus Terminal for 8D Part # 250-0473
One piece end terminal.
Right end of Battery.
1/2" - 13 Steel Positive Stud
3/8" - 16 Steel Negative Stud
Terminal not serviceable

Type B

Cat Premium High Output Batteries — Built Tough to Exceed Demanding Performance Test Requirements:

- **100 hour Vibration Testing – Five Times the Industry Standard**

Battery must be able to withstand vibration forces without suffering mechanical damage, loss of capacity, loss of electrolyte or without developing internal/external leaks

Battery must pass a high rate discharge test after the vibration testing

- **Five 72-hour Deep Discharge/Recharge Test Cycles**

Battery must recover to 25 charging amps within 20 minutes and meet Industry Electrical Performance Standards

- **30 Day Complete Discharge Test**

Battery must recover to 25 charging amps within 60 minutes and meet Industry Electrical Performance Standards after recharging

- **SAE J2185 Life Cycle Test**

Battery subject to deeper discharge and charge cycles at extreme temperatures not normally encountered in starting a machine or vehicle

- **Cold Soak Test**

Battery cold soaked at sub-freezing temperatures and then tested by starting an equally cold engine



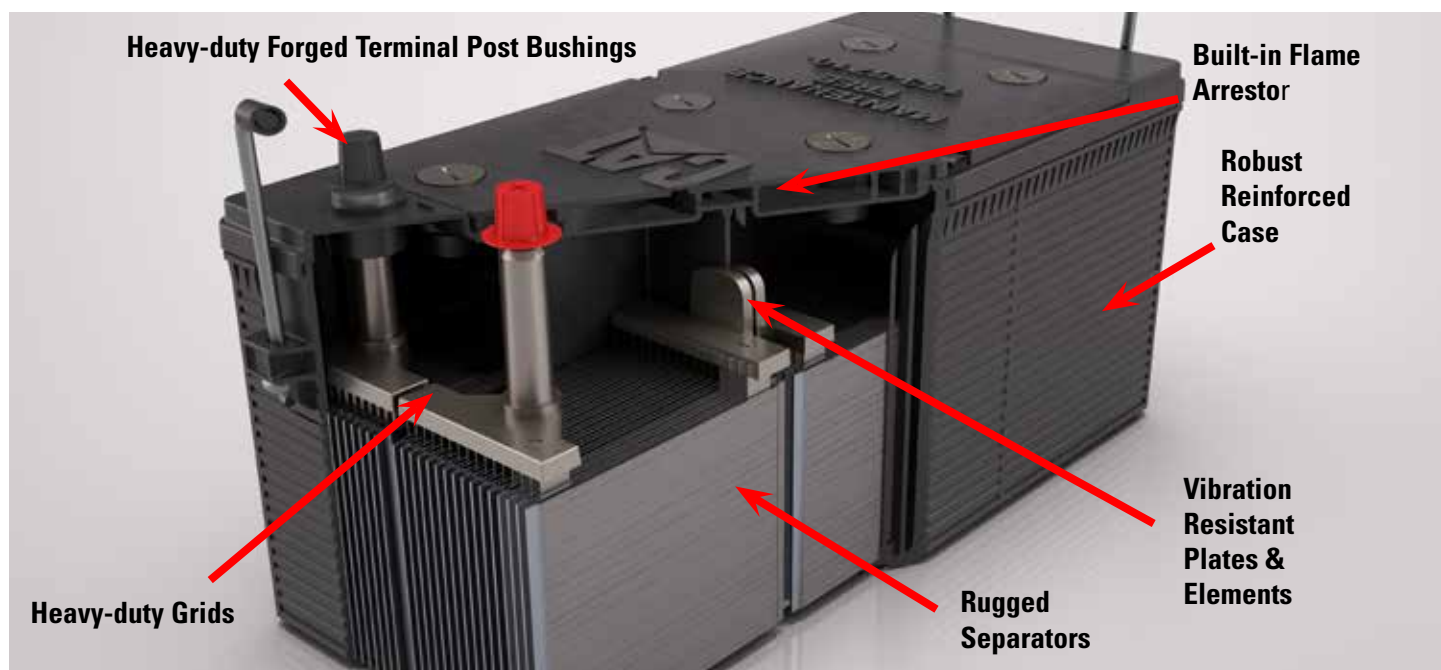
Battery Accessories

- Group 31 - Charging Posts for Stud Terminals - Part # 4C-5637
- Screw-in Charging Posts for Side Terminals - Part # 4C-5638
- Wing Nut - Part # 2B-9498 for Part #'s 175-4390/175-4370/175-4360/8C-3628
- Wing Nut - Part # 3B-0723 for Part #'s 8C-3638 and 8C-3639
- Booster Cable 12' (3.66 m) - Part # 4C-4911
- Booster Cable 20' (6.00 m) - Part # 4C-4933
- Heavy Duty Commercial Fast Charger (110V) - Part # 4C-4921
- Heavy Duty Commercial Fast Charger (220V) - Part # 4C-4910

Note: Ratings and Part Numbers are subject to change without notice.



Recycle all scrap batteries.
We accept lead-acid batteries for recycling.



Robust Components = Long Life + Reliable Starts

- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage that causes corrosion and black posts. Thicker internal terminal posts provide lower electrical resistance and higher cold cranking amp output.
- Rugged micro porous polyethylene envelope separators protect against “shorts” and vibration damage. Deep Cycle batteries utilize double insulated Glass mat separators for longer cycling life.
- Maintenance Free Accessible batteries utilize calcium lead alloy on both positive and negative plates that reduces gassing and water consumption. Automotive batteries have Silver (Ag) Calcium Alloy Grids for resistance to high underhood temperatures.
- Heavy-duty, full frame battery grids with no sharp edges. An optimum acid/paste combination provides better charge acceptance after a deep discharge.
- Positive and Negative plates are anchored to the container bottom and the cell element is locked at the top for maximum vibration resistance. Straps are thicker, heavier and cast (not welded) into the plates.
- Manifold vented cover with built-in Flame Arrestor...a safety feature that directs corrosive gases away from the battery and hold-downs.
- Robust reinforced case provides extra strength in all temperature extremes. Brickwork design on sides reduces chance of punctures and case flexing. Embossed part number and descriptors for easy serviceability.

CAT DEALERS DEFINE WORLD-CLASS PRODUCT SUPPORT.

We offer you the right parts and service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investment.





Jacket Water Heater with Pump

Diesel Gensets: C27, C32

Caterpillar offers a factory installed Jacket Water Heater for improved cold-starting capability.

The Jacket Water Heater with the pump is a complete coolant pre-heater with thermostat, pump and all required controls.

Forced circulation of the coolant delivers uniform heating throughout the entire engine, reduces wear from cold spots and offers a significant reduction in electrical consumption.

The Jacket Water Heater operates automatically when provided contacts are supplied with a 24 Volt DC signal from the engine.

Features

- Factory installed
- Complete with hoses, thermostat and pump
- Base frame mounting minimizes engine induced vibration
- Automatically disconnected when engine is running via the generator space heater relay
- Supplied with UL recognized components
- Thermostat is factory pre-set to 54°C (130°F)

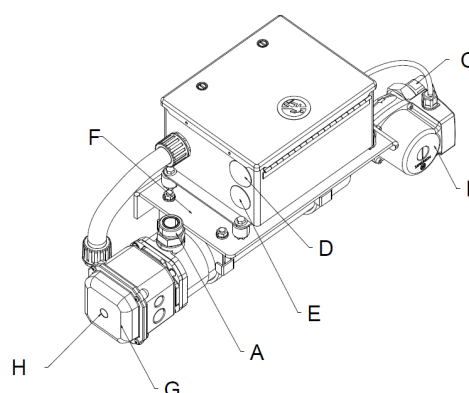
Heater Design Description

The jacket water heater package is designed to efficiently pre-heat the engine by heating and circulating the engine's coolant. This design results in the following benefits:

- Increase life of heater hoses, engine seals, and heating elements
- Improve heat transfer efficiency from elements to engine coolant
- More uniform engine temperature distribution
- Application of a thermostat with a reduced thermal differential
- Lower customer utility costs and increased heater reliability
- Heater thermostat's setpoint is preset from the factory

Heater Operation / Wiring

A 32 L/pm (10 gpm) pump is located at the heater outlet to push the coolant through the heater. A fixed thermostat is located inside the heater tank near the outlet of the heater and responds to the temperature of the coolant entering the tank. The figure below shows the general heater design.



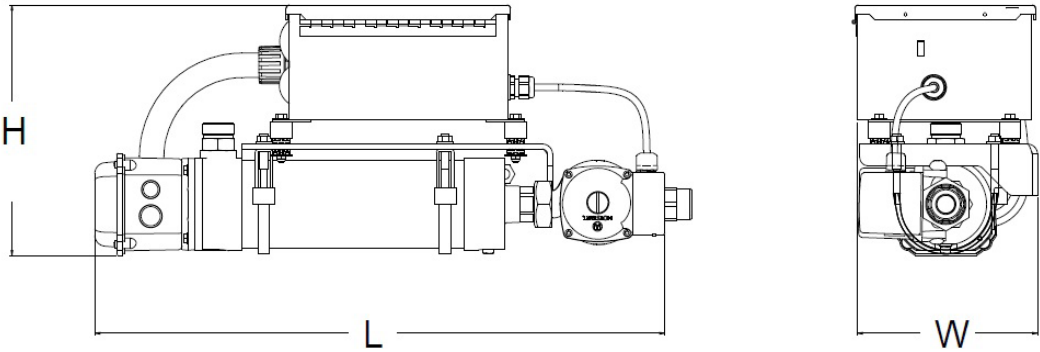
- | | |
|------------------------------------|-----------------------------------|
| A. Discharge port | E. Control wiring entrance |
| B. Pump / motor | F. Mounting base |
| C. Suction (behind unit) | G. Element assembly |
| D. Power in wiring entrance | H. Thermostat |

Jacket Water Heater



Specifications

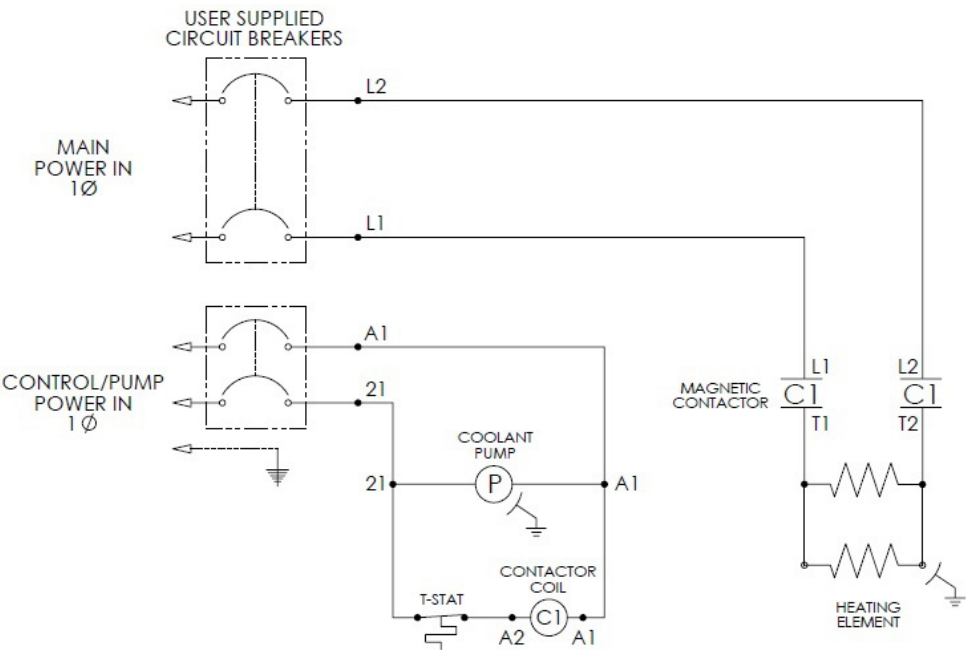
	Voltage	
	240	220
Ratings	9 kW	9 kW
Frequency	60	50
Phase	Single	Single
Amps	37.5A	41A
Flow Rate	38 L/pm (10 g/min)	38 L/pm (10 g/min)
Pump Rating	240 VAC 97W	220 VAC 90W
Fixed Thermostat	38°C – 54°C (100°F – 130°F)	
Length	694.8 mm (27.3")	
Width	213.7 mm (8.4")	
Height	290.6 mm (11.4")	
Weight	18.84 kg (41.54 lbs)	



Jacket Water Heater



Wiring Diagram



LET'S DO THE WORK.™

LEHE1310-02 (05/23)

www.cat.com/electricpower
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Materials and specifications are subject to change without notice.
CAT, CATERPILLAR, LET'S DO THE WORK, their respective logos, "Caterpillar Corporate Yellow" the "Power Edge" and Cat "Modern Hex" trade dress as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

3

DRAWINGS

CABLE LUG INFORMATION:

2000 AMP GENERATOR MAINLINE CIRCUIT BREAKER:
BUS BAR CONNECTION ON CAT DRAWING 621-3215 PER PHASE

NEUTRAL BUS AND GROUND STUD

2000 AMP AUTOMATIC TRANSFER SWITCH:
NORMAL, EMERGENCY AND LOAD
SIX (6) CABLES, #1/0 AWG TO 600 MCM PER PHASE AND NEUTRAL

GROUND LUG MOUNTING STUDS

NOTE:

THE ELECTRICAL CONTRACTOR IS TO VERIFY THE SUITABILITY OF THE ABOVE CABLE CONNECTIONS. RING POWER NEEDS TO BE ADVISED OF ANY REQUIRED CHANGES PRIOR TO THE RELEASE OF THE EQUIPMENT TO THE MANUFACTURER. OPTIONS MAY BE AVAILABLE, BUT COULD REQUIRE ADDITIONAL CHARGES. **ALL WIRING TO BE STRANDED. NO EXCEPTIONS.**

DRAWINGS PREPARED FOR:
RING POWER
OCOEE WTP (SOURCEWELL)
9,100 USEABLE / 10,354 ACTUAL GALLON UL#142 DIESEL FUEL TANK
w/ 76 DBA @ 7 METERS SOUND ENCLOSURE
WO# 53770
11/29/2023



1900 NE 25TH AVE, OCALA, FL 34470
PHONE (352) 414-4700 FAX (352) 414-4642

☐ APPROVED

☐ APPROVED WITH CHANGES

☐ REVISE AND RESUBMIT

☐ REJECTED _____

SUBMITTAL WAS FULLY REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CUSTOMER SUPPLIED DOCUMENTS. FIDELITY MANUFACTURING IS RESPONSIBLE FOR CONFIRMING THE DESIGN AND DIMENSIONS FOR TOLERANCE, CLEARANCES, AND FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION AND WILL BE IN COMPLIANCE TO ALL CUSTOMER SUPPLIED DOCUMENTS. ANY REQUIRED CHANGES NOT INCLUDED IN THE CUSTOMER SUPPLIED DOCUMENTATION SHALL BE SOLELY AT THE CUSTOMERS EXPENSE ONCE CUSTOMER APPROVAL IS APPLIED TO THIS SUBMITTAL.

BY: _____ DATE : _____

FIDELITY MANUFACTURING
1900 NE 25TH AVE
OCALA, FL 34470

TANK NOTES:

- 1. ALL FITTINGS TO BE CARBON STEEL WELD FLANGES (UNLESS OTHERWISE NOTED)
- 2. EXTERIOR FINISH: "BLACK" - TKP – STANDARD TANK/BASE PAINT, MARINE INLAND
- NSK – NON-SKID SURFACE COATING ON TANK TOP
- 3. INNER TANK DIMENSIONS: 460.50"L x 120.875"W x 44.742"H
- 4. APPROXIMATE USEABLE TANK CAPACITY: 9,100 GALLONS @ 90 %
- 5. ACTUAL TANK VOLUME (100%): 10,354 GALLONS
- 6. APPROXIMATE TANK WEIGHT: 20,400 LBS

NOTES:

- 1. GENERATOR, CAT C32 D1000 GC
DIMENSIONS: 164.33"L x 78.77"W x 87.46"H
WEIGHT: 14,669 LBS
DRAWING # : 621-3215 20SEP21
- 2. TOTAL AIRFLOW REQUIRED: 36395 CFM
- 3. SOUND ATTENUATION LEVEL: 76 DBA @ 7 METERS
- 4. INSULATION: 2" MAT-FACED MICRO-AIRE DUCT BOARD
- 5. LINING: MILL-FINISH PERFORATED ALUMINUM
- 6. ENCLOSURE WALLS: 4" ALUMINUM TUBE WELDED FRAME
- 7. ENCLOSURE ROOF: 2" ALUMINUM TUBE WELDED FRAME
- 8. ENCLOSURE DIMENSIONS: 317"L x 127"W x 114"H
- 9. ENCLOSURE WEIGHT (APPROX.): 7,500 LBS
- 10. ENCLOSURE COLOR: WHITE
- 11. ENCLOSURE SHALL BE PROVIDED w / 4-POINT LIFTING LUGS
- 12. TOTAL PACKAGE WEIGHT: 42,569 LBS

Sheet List Table

Sheet Number	Sheet Title
1	COVER SHEET
2	SPECIAL INSTRUCTIONS
3	ASSEMBLY
4	SA LVL 2 ENCLOSURE RIGHT VIEW
5	SA LVL 2 ENCLOSURE END VIEW
6	ELECTRICAL PLAN
7	UL 142 DIESEL FUEL TANK
8	STAIRS
9	SUGGESTED PAD LAYOUT
10	ANCHOR DETAIL

REVISIONS:

REVISION LEVEL	REVISION DESCRIPTION	SHEET OF CHANGE(S)	ENGINEER	DATE
00	INITIAL RELEASE (QUOTE # 110886REV2)		BK	11/29/2023
01				
02				
03				
04				

DRAWINGS PREPARED FOR:
RING POWER
OCOEE WTP (SOURCEWELL)
9,100 USEABLE / 10,354 ACTUAL GALLON UL#142 DIESEL FUEL TANK
w/ 76 DBA @ 7 METERS SOUND ENCLOSURE
WO# 53770
11/29/2023

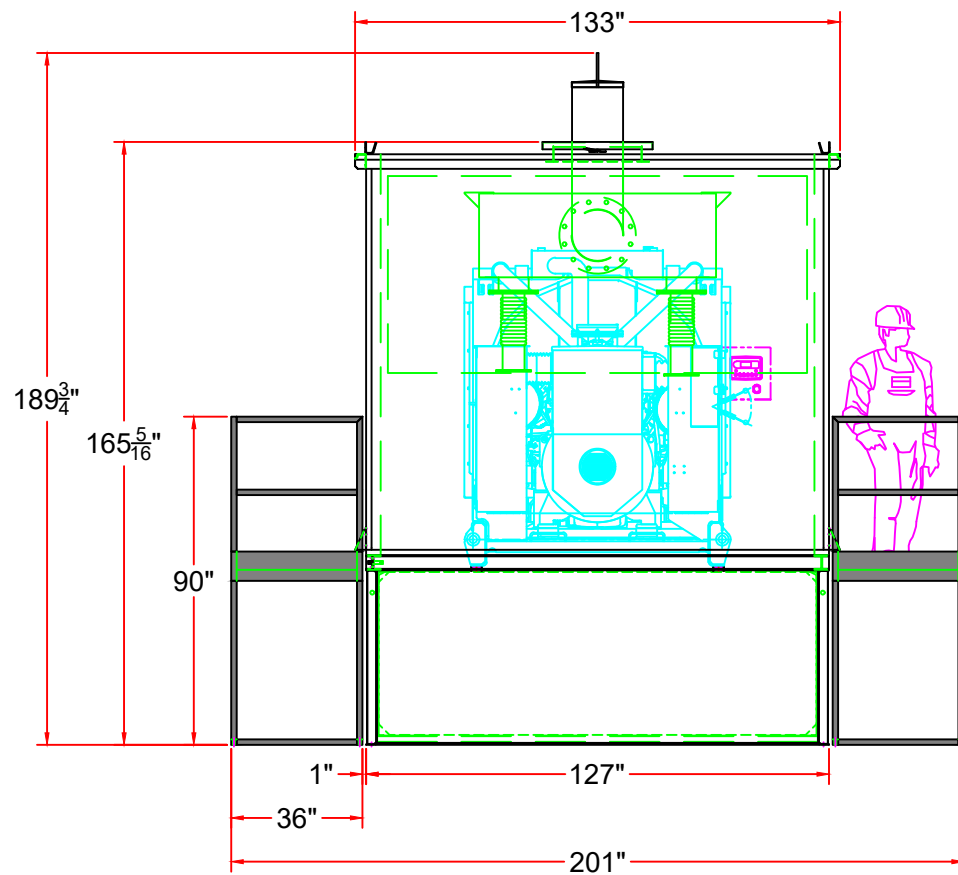


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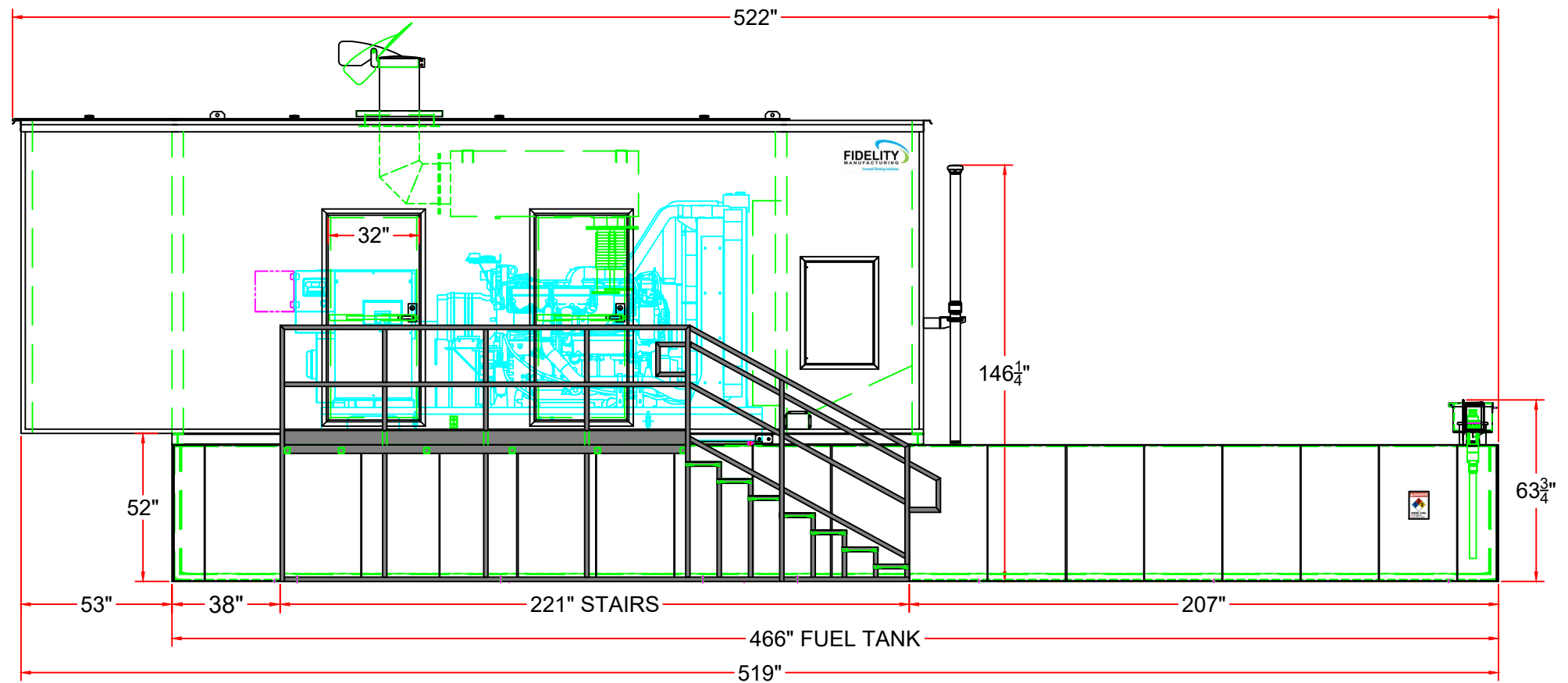
SPECIAL INSTRUCTIONS	
1	ENCLOSURE WIND-LOAD RATED AT 150 MPH
2	ENCLOSURE DOORS TO HAVE KEY LOCKABLE PANIC HARDWARE (CRASH BARS)
3	LARGE MISSILE IMPACT RATED PER HVHZ FBC SEC. 1620 - SEC. 1626 AND CHAPTER 2. 2020 FBC, FLORIDA PRODUCT APPROVAL NUMBERS: -FL 20667-R2 - WALL PANEL -FL 21050-R1 - DOORS
4	ELECTRICAL PKG OPTION INSTALLED IN ENCLOSURE. INCLUDES: -100 AMP MAIN 3φ PANEL BOARD (120/208V) -250 AMP BUS (22 KAIC RATED) -NEMA 3R/12 ENCLOSURE -SIEMENS -BOLT-IN BREAKERS (10 KAIC RATED) -18 SPACE -THREE LED LIGHTS (VAPOR PROOF) -TWO 20A GFCI OUTLETS (IVORY) -TWO 3-WAY SWITCHES (IVORY) -GENERATOR ACCESSORY CONNECTIONS FOR JACKET WATER HEATER, BATTERY CHARGER, AND ALTERNATOR HEATER. INCLUDES INSTALL OF CUSTOMER SUPPLIED BATTERY CHARGER (IF SHIPPED LOOSE)
5	THREE DC LED LIGHTS WITH ONE-HOUR TIMER SWITCH. EACH BULB 10W 950 LUMENS (EQUIVALENT TO 65W INCANDESCENT)
6	NFPA DECAL, DANGER DIESEL FUEL, NO SMOKING, NO OPEN FLAMES. ONE DECAL PER SIDE OF TANK (TOTAL OF 2 DECALS APPLIED)
7	UPGRADED PAINT COATING, ANTI-SLIP (ANTI-SKID ON TANK LID), NSK
8	NFPA 30 OPTIONS (FDEP COMPLIANT): -REMOTE ANNUNCIATOR -- 3 RED LIGHT (24 VDC) UL LISTED NEMA4 ENCLOSURE STANDARD WITH AUDIBLE ALARM HORN AND SILENCE/RESET BUTTON. TYPICAL ARRANGEMENT FOR HIGH FUEL LEVEL, LOW FUEL LEVEL, AND RUPTURE BASIN ALARM POINTS -FUEL FILL EXTENSION FOR STATIC DISCHARGE (FUEL FILL EXTENDED TO 6" FROM BOTTOM OF TANK). USE DROP TUBE ON OPV -OVERFILL PREVENTION VALVE (2" CAMLOK CONNECTOR) INSTALLED IN FILL/SPILL BUCKET SET @ 95% -7-1/2 GALLON FILL/SPILL BUCKET W/ PAD LOCKABLE LID -NORMAL VENT EXTENDED 12 FEET ABOVE GRADE
9	PROVIDE AND INSTALL 240-30 OHMS TWIN-SITE FUEL GAUGE AND SENDER

10	INSTALLATION OF PLUGS REQUIRED AND ONE VACUUM GAUGE TO PULL INTERSTITIAL AREA TO MAX VACUUM. DOCUMENTATION OF VACUUM READINGS PRIOR TO SHIPMENT. PACKAGE SECONDARY VENT AND SECONDARY TANK ACCESSORIES TO SHIP LOOSE WITH TANK. TANK TO REMAIN UNDER VACUUM UNTIL REACHING JOBSITE. END USER RESPONSIBLE FOR INSTALLATION OF ACCESSORIES
11	MOUNT GENSET AND INSTALL FUEL LINES. BALL VALVES INSTALLED IN THE SUPPLY/RETURN LINE TO/FROM THE ENGINE
12	1/4" X 3" X 10'L FULL LENGTH NEOPRENE PADS (10 ROLLS) SHIPPED LOOSE FOR INSTALLATION BETWEEN FUEL TANK AND CONCRETE PAD
13	1/4" X 6" X 10'L FULL LENGTH NEOPRENE PADS (4 ROLLS) SHIPPED LOOSE FOR INSTALLATION BETWEEN FUEL TANK AND CONCRETE PAD
14	TWO SETS OF ALUMINUM STAIRS AND PLATFORMS WITH MOLDED FIBERGLASS DECKING
15	THREE YEAR LIMITED WARRANTY
16	STAMPED PE DRAWINGS, DBPR LABEL, AND CALCULATIONS FOR WIND/SEISMIC CERTIFICATION FOR ENCLOSURE DESIGN TO BE SUPPLIED BY STATE OF FLORIDA PROFESSIONAL ENGINEER WIND/SEISMIC QUALIFICATION CERTIFICATE CERTIFYING THAT ENCLOSURE PACKAGE WILL WITHSTAND THE EFFECTS OF WIND AND EARTHQUAKE LOADING DETERMINED ACCORDING TO ASCE/SEI 7, INCLUDING: -WIND LOAD -ENCLOSURE TO TANK, TANK TO PAD, GENERATOR TO TANK, AND STAIR/ PLATFORM TO PAD ANCHORING -ROOF LOAD SHALL BE EQUAL TO OR GREATER THAN 53 LBS PSF -VERIFICATION OF MEMBER STRESSES -VERIFICATION OF WELDING -HVHZ QUALIFICATION -ADDITIONAL ACCESSORIES AND COMPONENTS (WEIGHING AT LEAST 20 LBS) ATTACHED TO TANK OR ENCLOSURE

PLEASE NOTE THAT THE FOLLOWING ITEMS WILL SHIP LOOSE AND REQUIRE ON-SITE ASSEMBLY BY OTHERS	
1	EXHAUST ELBOW AND RAIN CAP
2	NORMAL VENT PIPING
3	SECONDARY VENT AND SECONDARY TANK ACCESSORIES
4	TWO SETS OF ALUMINUM STAIRS AND PLATFORMS
5	1/4" X 3" X 10'L FULL LENGTH NEOPRENE PADS (10 ROLLS)
6	1/4" X 6" X 10'L FULL LENGTH NEOPRENE PADS (4 ROLLS)



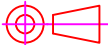
REAR VIEW

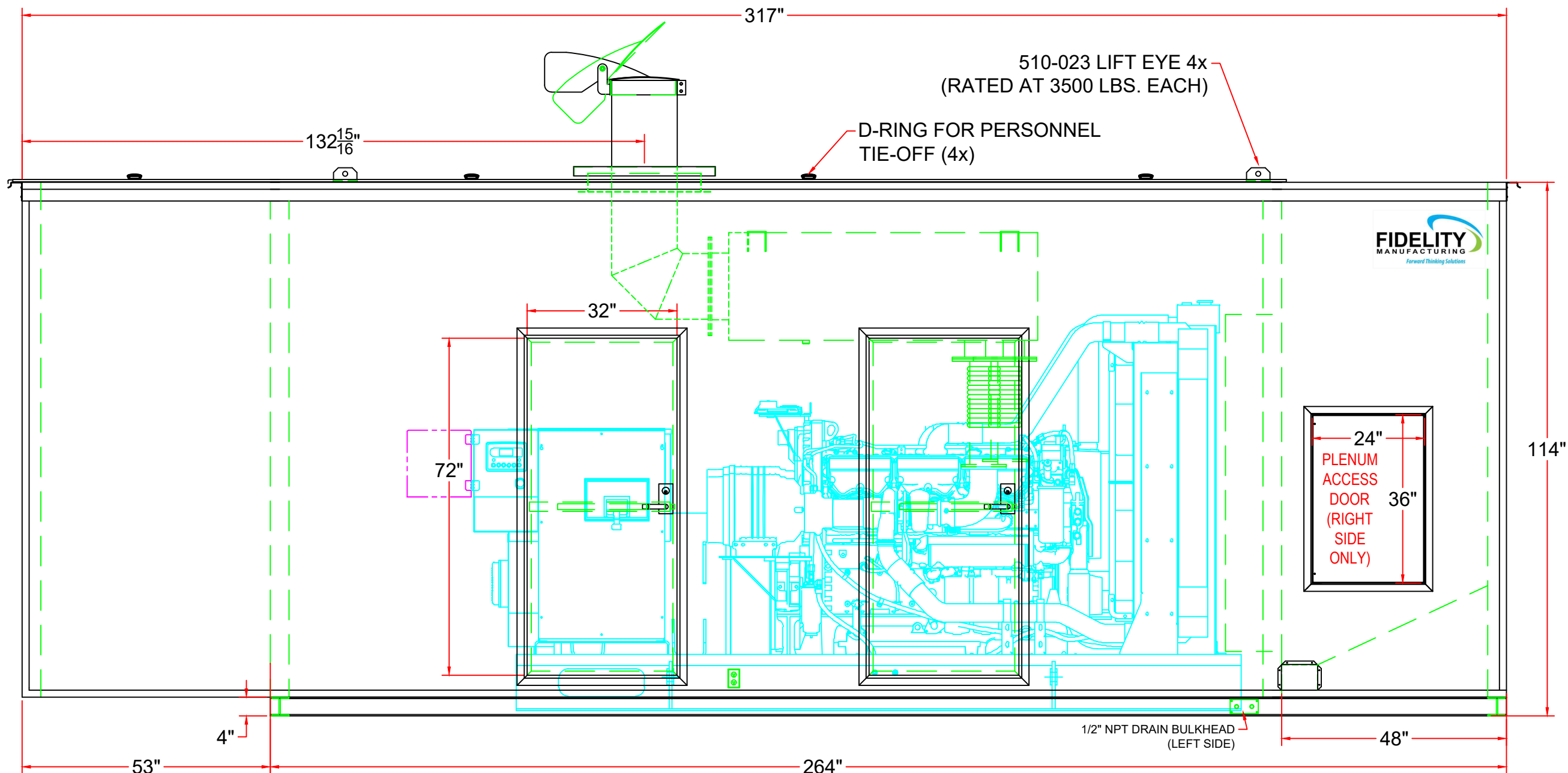


RIGHT SIDE VIEW



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LOAD BANK WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT	UL #142 File No. MB27650 
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.	
CUSTOMER:					 THIRD-ANGLE PROJECTION
RING POWER					
CAT C32 D1000 GC					
DESCRIPTION ASSEMBLY					
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.					DESIGNATION DL 2
USEABLE GALLONS / SOUND ATTENUATION LEVEL					
9,100 AT 90% / 76 DBA @ 7 METERS					
OCOEE WTP (SOURCEWELL)					
DWG.	BK	WO# 53770			
CHK.	JAL				
APP.	BJS				
DATE	11/29/2023	SCALE:	SHEET 3 OF 10		



RIGHT SIDE VIEW

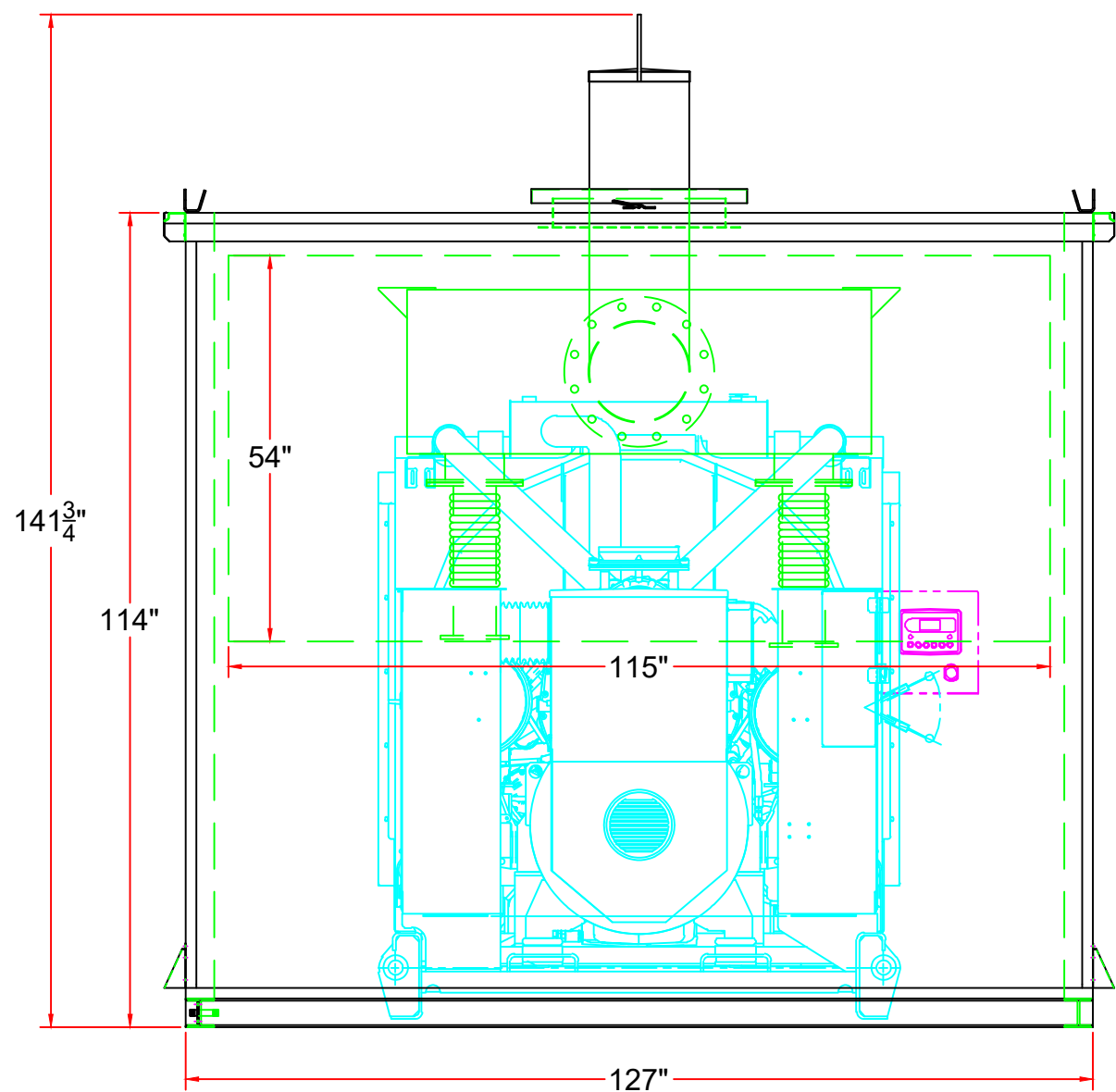
EXHAUST LIST		
QTY.	PART	PART #
1	14" RAINCAP	708-006 / SM-RC-14-T
1	90° 14" ELBOW FLANGE O.E. A=14", B=44"	EB-FOE-14
1	14" HOSPITAL PLUS GRADE SILENCER (SEE DWG)	SMR4P-T1-14
2	14" ANSI NUT, BOLT, GASKET KIT	FIDELITY
1	6" FLEX, 6" CAT ENGINE FLANGE O.E, 8" ANSI FLOATING FLANGE O.E., 23.03" OAL (RIGHT SIDE)	SMS
1	6" FLEX, 6" CAT ENGINE FLANGE O.E, 8" ANSI FLOATING FLANGE O.E., 21.93" OAL (LEFT SIDE)	SMS
2	6" CAT NUT, BOLT, GASKET KIT	SM-HWK-6CT

NOTE: DRAIN BULKHEAD FOR REFERENCE ONLY. ACTUAL LOCATION TO BE DETERMINED BY TECHNICIAN.

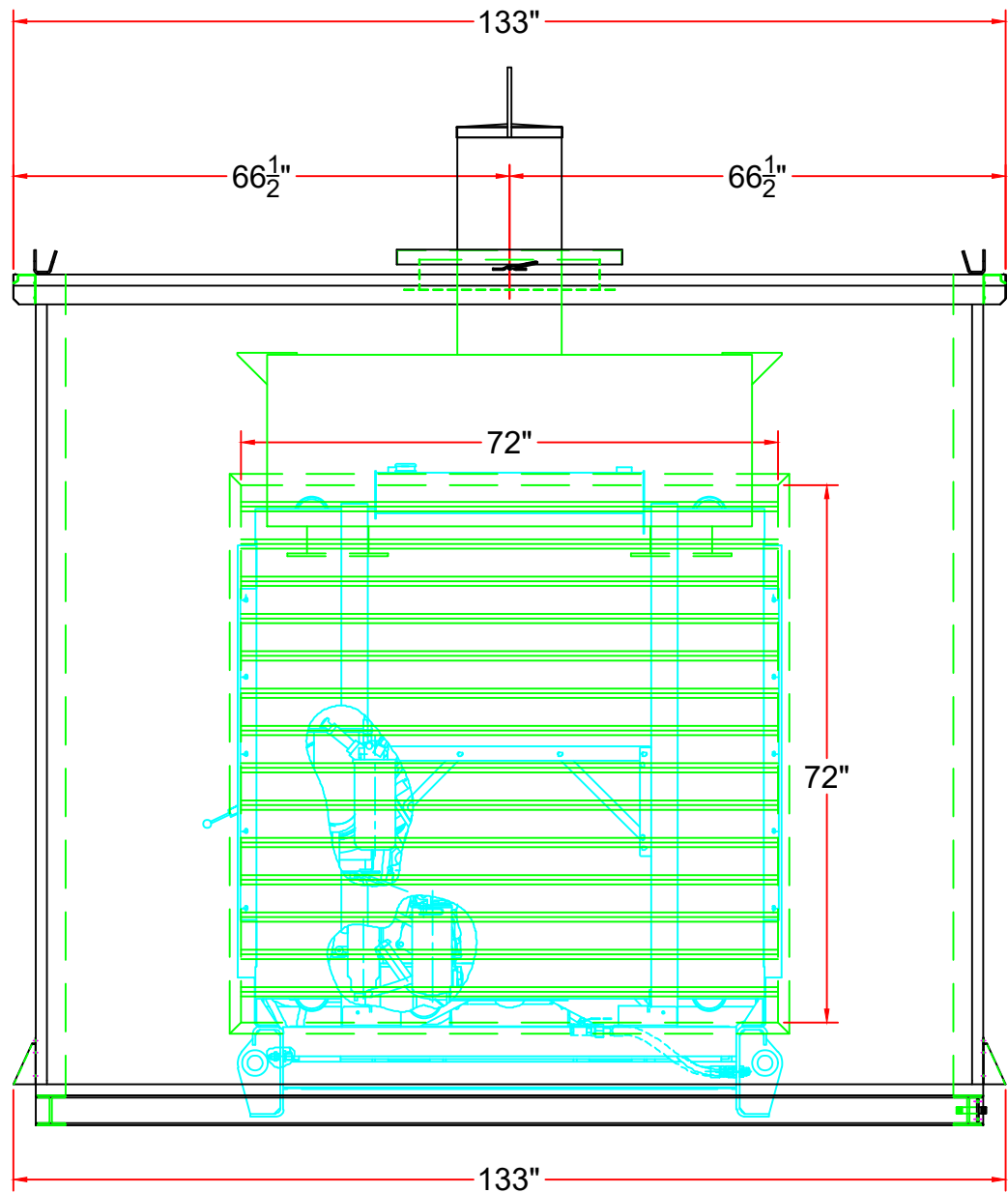


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SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.
CUSTOMER:				 THIRD-ANGLE PROJECTION
RING POWER				
CAT C32 D1000 GC				
DESCRIPTION		SA LVL 2 ENCLOSURE RIGHT VIEW		DESIGNATION DL 2
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.				
SOUND ATTENUATION LEVEL				
76 DBA @ 7 METERS				
OCOOE WTP (SOURCEWELL)				
DWG.	BK	WO # 53770		
CHK.	JAL			
APP.	BJS			
DATE	11/29/2023	SCALE:	SHEET	4 OF 10



REAR VIEW



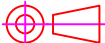
FRONT VIEW

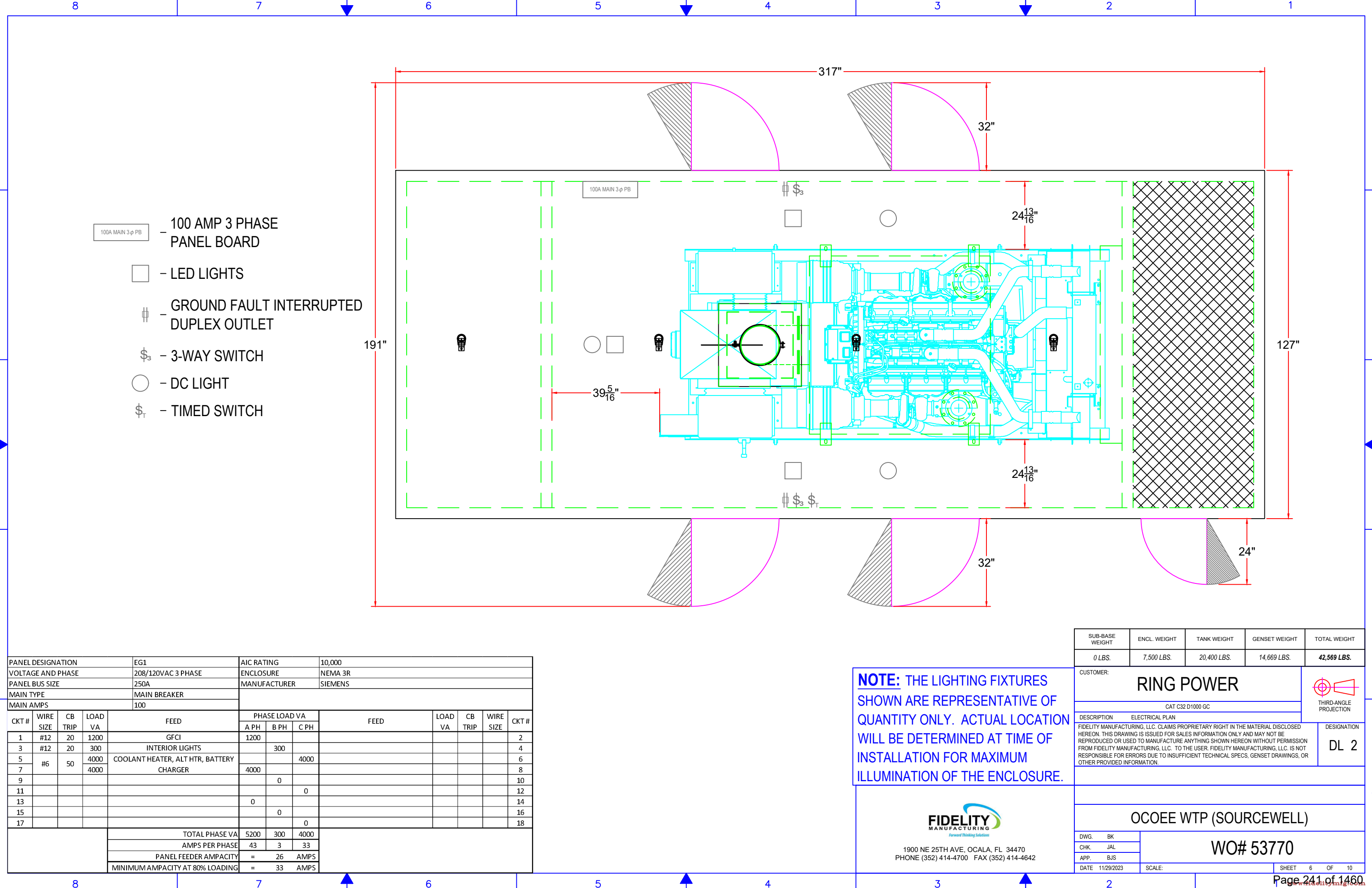
DAMPER LIST		
QTY.	DIMENSIONS	PART #
1	72"W X 72"H	CB-601 / 551-348

NOTE: DRAIN BULKHEAD FOR REFERENCE ONLY. ACTUAL LOCATION TO BE DETERMINED BY TECHNICIAN.



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SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.
CUSTOMER: RING POWER				 THIRD-ANGLE PROJECTION
CAT C32 D1000 GC				
DESCRIPTION SA LVL 2 ENCLOSURE END VIEW				
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.				DESIGNATION DL 2
SOUND ATTENUATION LEVEL				
76 DBA @ 7 METERS				
OCOOE WTP (SOURCEWELL)				
DWG. BK	WO # 53770			
CHK. JAL				
APP. BJS				
DATE 11/29/2023				
SCALE:			SHEET 5	OF 10



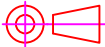
PANEL DESIGNATION				EG1		AIC RATING			10,000					
VOLTAGE AND PHASE				208/120VAC 3 PHASE		ENCLOSURE			NEMA 3R					
PANEL BUS SIZE				250A		MANUFACTURER			SIEMENS					
MAIN TYPE				MAIN BREAKER										
MAIN AMPS				100										
CKT #	WIRE SIZE	CB TRIP	LOAD VA	FEED	PHASE LOAD VA			FEED	LOAD VA	CB TRIP	WIRE SIZE	CKT #		
					A PH	B PH	C PH							
1	#12	20	1200	GFCI	1200							2		
3	#12	20	300	INTERIOR LIGHTS		300						4		
5	#6	50	4000	COOLANT HEATER, ALT HTR, BATTERY CHARGER			4000					6		
7			4000		4000				8					
9						0						10		
11							0					12		
13					0							14		
15						0						16		
17							0					18		
				TOTAL PHASE VA	5200	300	4000							
				AMPS PER PHASE	43	3	33							
				PANEL FEEDER AMPACITY	=	26	AMPS							
				MINIMUM AMPACITY AT 80% LOADING	=	33	AMPS							

NOTE: THE LIGHTING FIXTURES SHOWN ARE REPRESENTATIVE OF QUANTITY ONLY. ACTUAL LOCATION WILL BE DETERMINED AT TIME OF INSTALLATION FOR MAXIMUM ILLUMINATION OF THE ENCLOSURE.

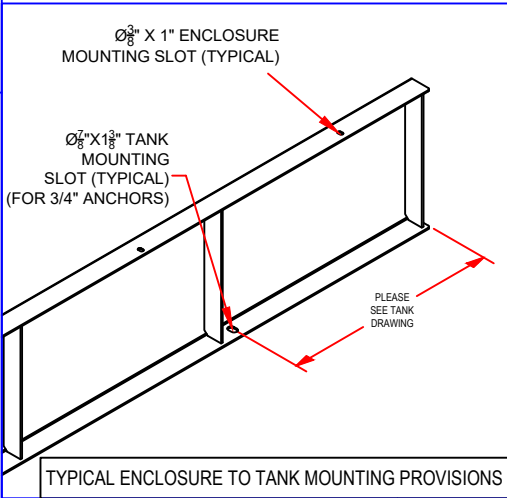
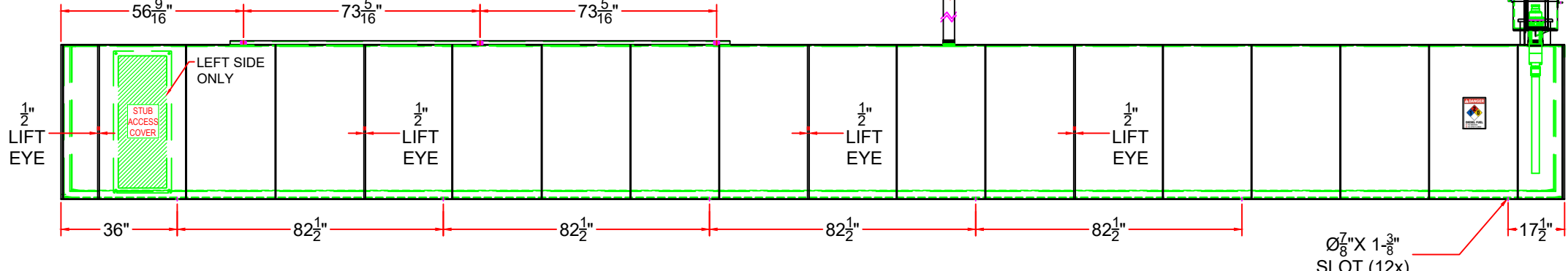
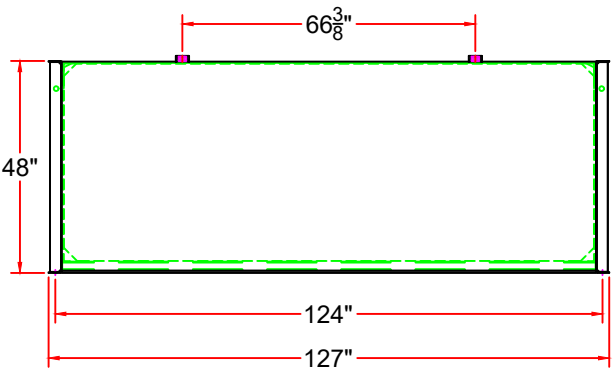
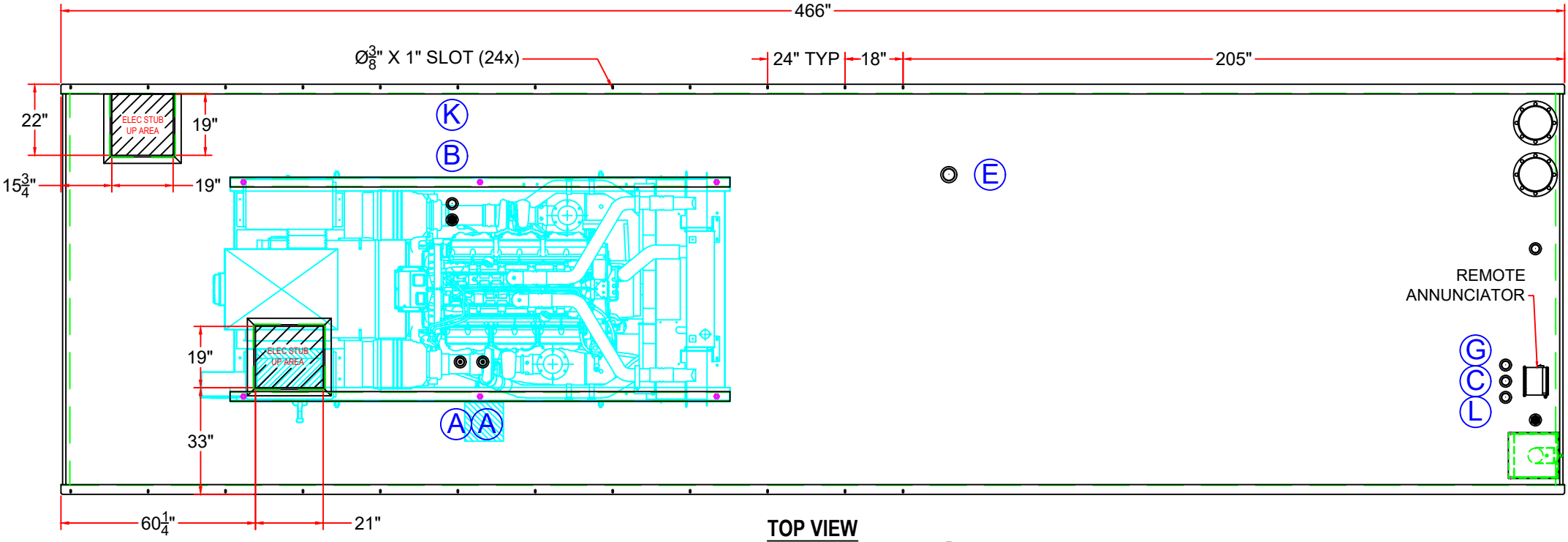


FIDELITY
MANUFACTURING
Forward Thinking Solutions

1900 NE 25TH AVE, OCALA, FL 34470
PHONE (352) 414-4700 FAX (352) 414-4642

SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.
CUSTOMER:				 THIRD-ANGLE PROJECTION
RING POWER				
CAT C32 D1000 GC				
DESCRIPTION ELECTRICAL PLAN				DESIGNATION DL 2
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER, FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.				
OCOOE WTP (SOURCEWELL)				
DWG. BK	WO# 53770			
CHK. JAL				
APP. BJS				
DATE 11/29/2023	SCALE:		SHEET 6	OF 10

FITTING	DESCRIPTION	LENGTH
A	2" X 1/2" NPT FUEL PORT DROP TUBE W/ BALL VALVE (QTY: 2)	
B	1-1/2" NPT 240-30 OHM TWIN-SITE FUEL SENDER	43-1/2"
C	2" NPT LOW FUEL SWITCH AT 25%	33-3/8"
D	1-1/2" NPT FUEL GAUGE	43-1/2"
E	3" NPT NORMAL VENT - EXTENDED	
F	8" ANSI FLANGE EMERGENCY VENT (PRIMARY)	
G	2" NPT TOP MOUNT LEAK DETECTION SWITCH & DRAIN PORT	
H	4" NPT LOCKABLE FUEL FILL / 7-1/2 GALLON FILL SPILL BUCKET W/ OVERFILL PREVENTION VALVE AT 95% W/ STATIC DISCHARGE	
J	8" ANSI FLANGE EMERGENCY VENT (SECONDARY)	
K	2" NPT SPARE FITTING (QTY: 2)	
L	2" NPT HIGH FUEL SWITCH AT 90%	4-1/2"



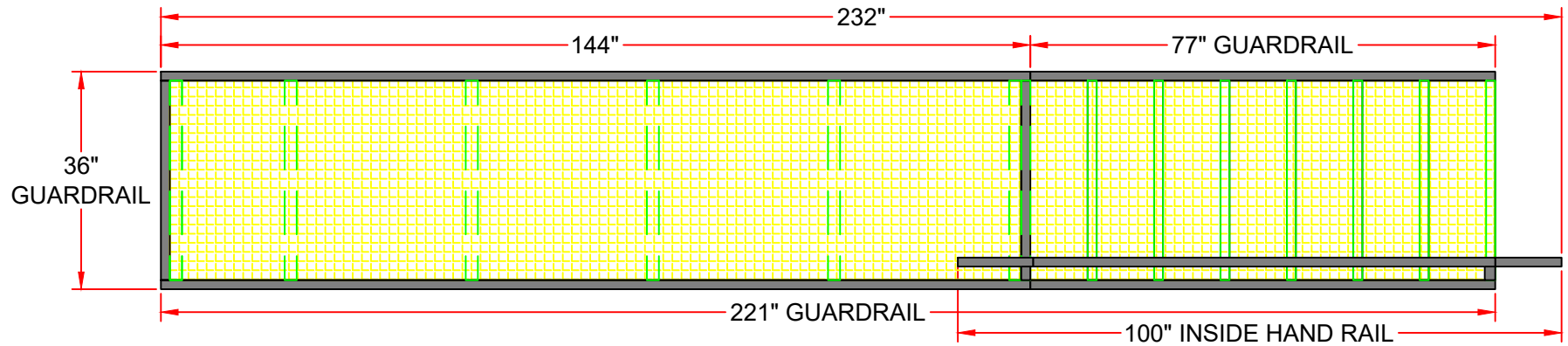
FDEP INFORMATION	
1	UL 142 TANK EQ# 497
2	FILL/SPILL CONTAINMENT EQ# 778
3	HIGH FUEL SWITCH AND LEAK DETECTION SWITCH EQ# 817
4	ROCHESTER FUEL LEVEL GAUGE EQ# 901
5	MORRISON OVERFILL PREVENTION VALVE EQ# 858



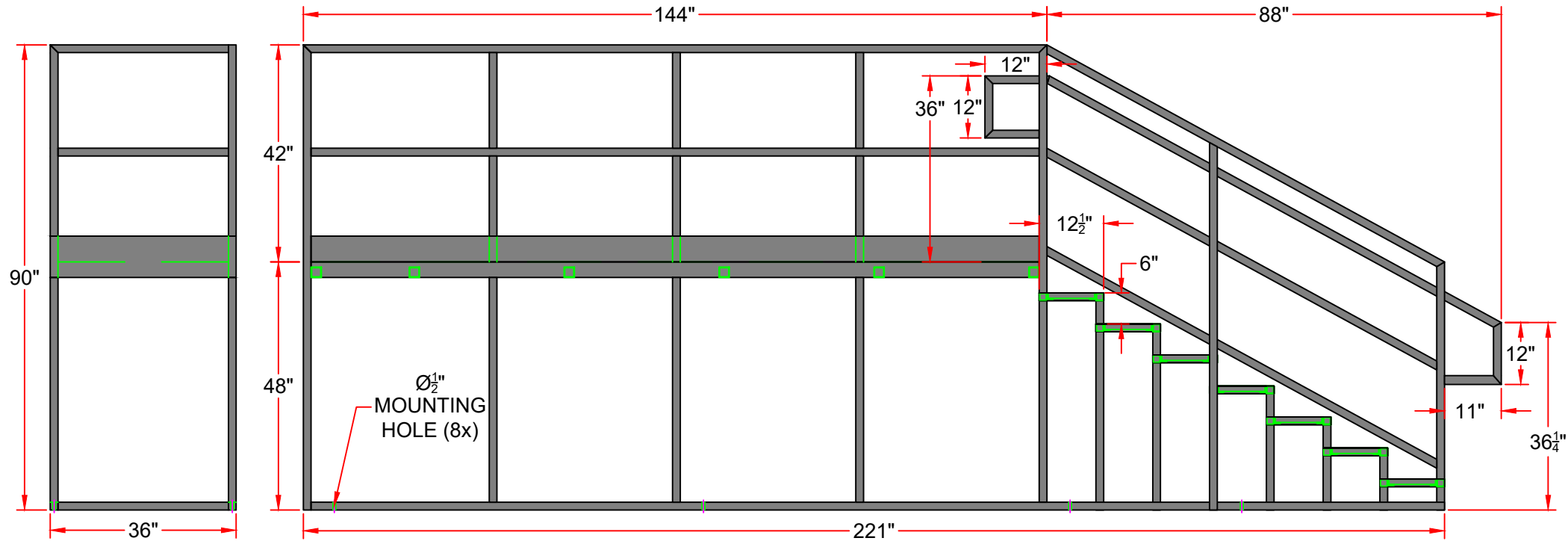
FIDELITY
MANUFACTURING
Forward Thinking Solutions

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PHONE (352) 414-4700 FAX (352) 414-4642

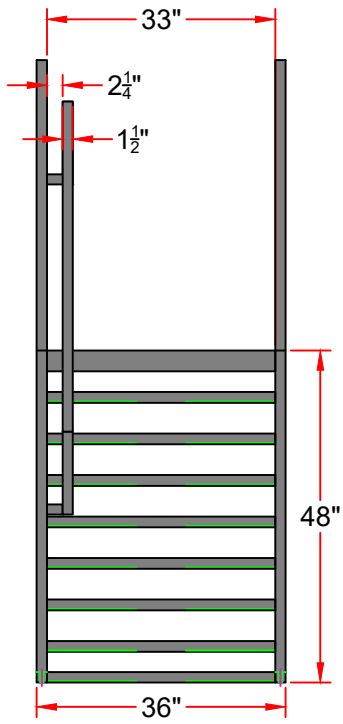
SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT	UL #142 File No. MB27650 
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.	
CUSTOMER: RING POWER					 THIRD-ANGLE PROJECTION
CAT C32 D1000 GC					
DESCRIPTION UL 142 DIESEL FUEL TANK					
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.					DESIGNATION DL 2
USEABLE GALLONS / ACTUAL GALLONS					
9,100 AT 90% / 10,354					
OCOEE WTP (SOURCEWELL)					
DWG. BK	WO# 53770				
CHK. JAL					
APP. BJS					
DATE 11/29/2023	SCALE:	SHEET 7 OF 10			



TOP VIEW



SIDE VIEW



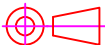
FRONT VIEW

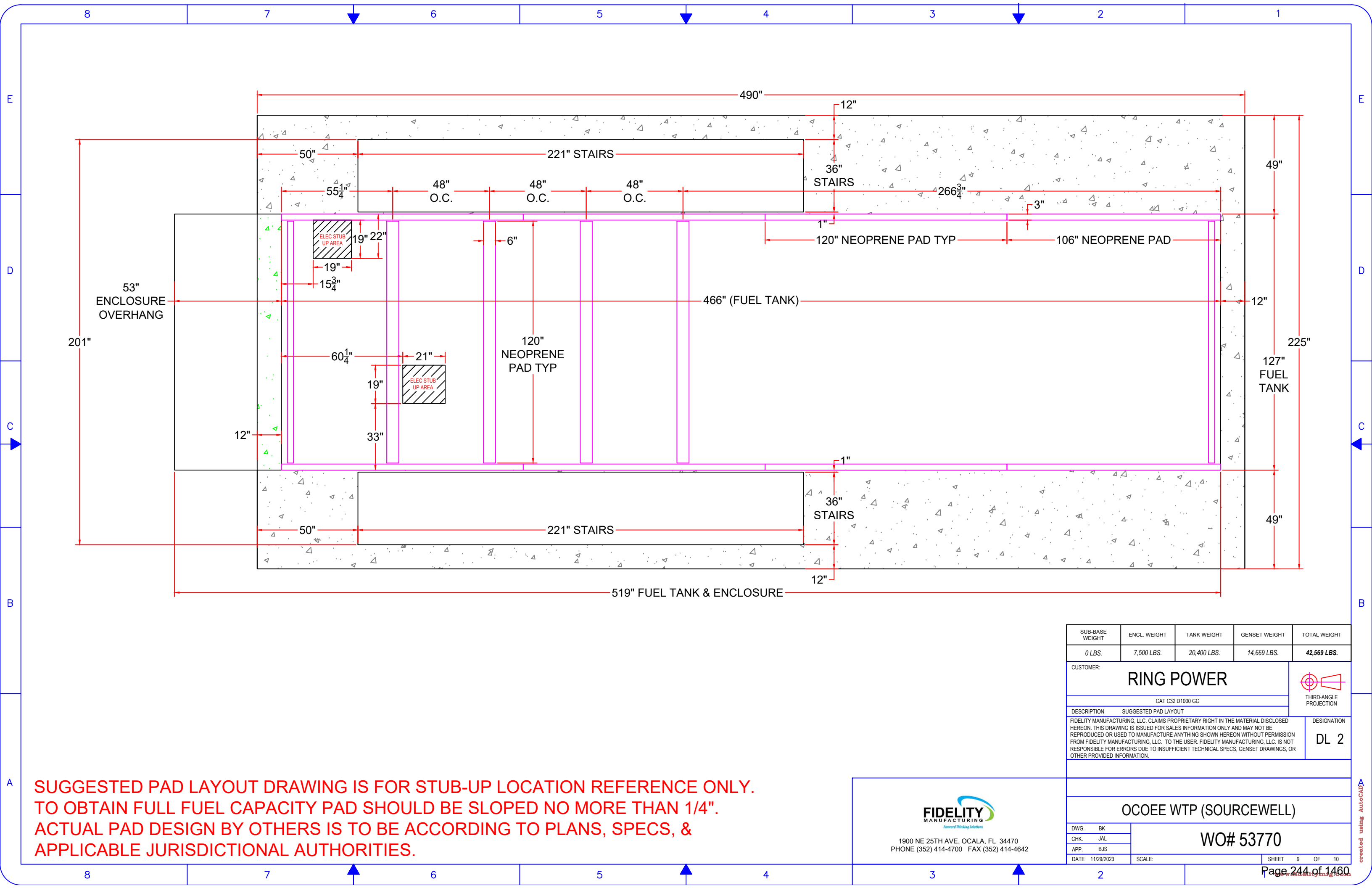
REAR VIEW

QUANTITY 2 (1 LEFT / 1 RIGHT)
APPROXIMATE WEIGHT 460 LBS EACH



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SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.
CUSTOMER:				 THIRD-ANGLE PROJECTION
RING POWER				
CAT C32 D1000 GC				
DESCRIPTION: STAIRS				DESIGNATION DL 2
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.				
STAIR AND PLATFORM WEIGHT 920 LBS.				
OCOOE WTP (SOURCEWELL)				
DWG. BK	WO# 53770			
CHK. JAL				
APP. BJS				
DATE 11/29/2023				
SCALE:			SHEET 8	OF 10

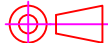


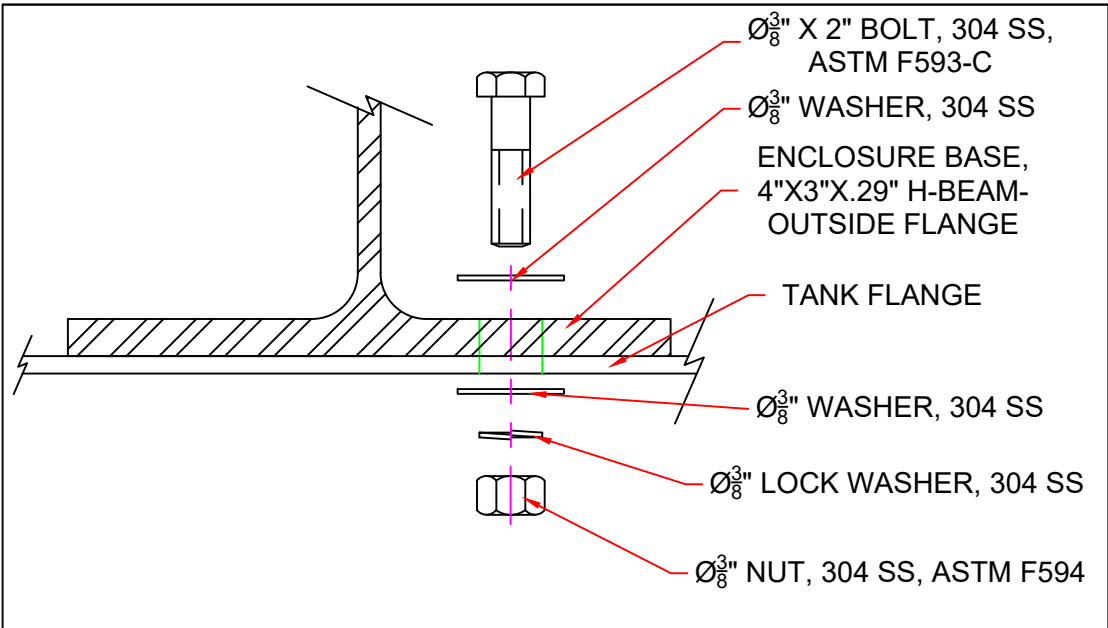
SUGGESTED PAD LAYOUT DRAWING IS FOR STUB-UP LOCATION REFERENCE ONLY.
TO OBTAIN FULL FUEL CAPACITY PAD SHOULD BE SLOPED NO MORE THAN 1/4".
ACTUAL PAD DESIGN BY OTHERS IS TO BE ACCORDING TO PLANS, SPECS, &
APPLICABLE JURISDICTIONAL AUTHORITIES.



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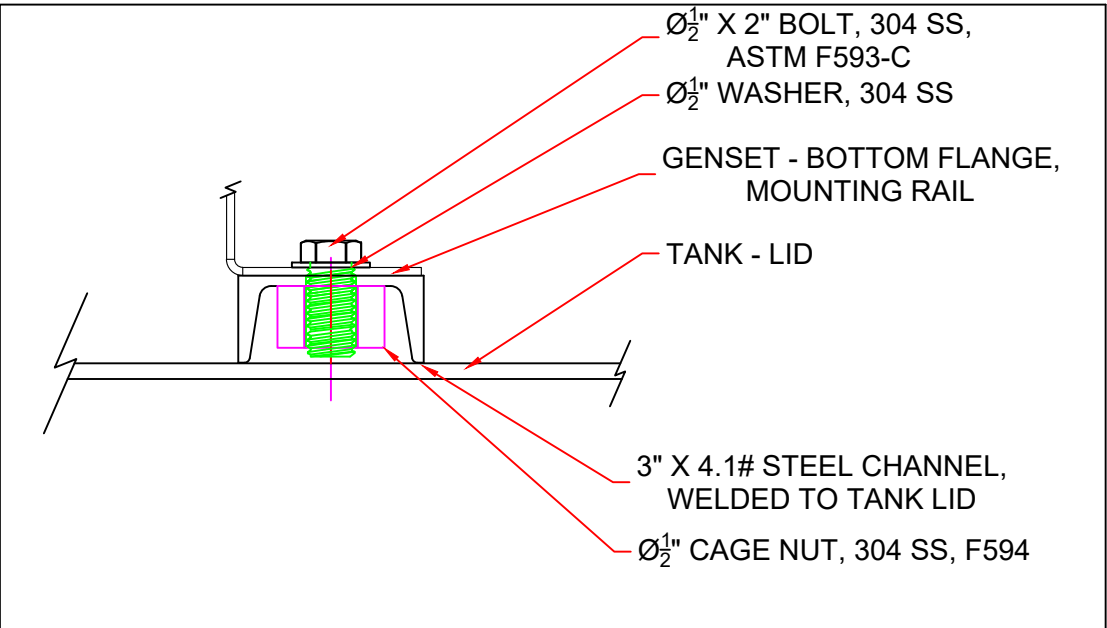
1900 NE 25TH AVE, OCALA, FL 34470
PHONE (352) 414-4700 FAX (352) 414-4642

SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.
CUSTOMER:				 THIRD-ANGLE PROJECTION
RING POWER				
CAT C32 D1000 GC				
DESCRIPTION		SUGGESTED PAD LAYOUT		DESIGNATION DL 2
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.				
OCOE WTP (SOURCEWELL)				
DWG.	BK	WO# 53770		
CHK.	JAL			
APP.	BJS			
DATE	11/29/2023	SCALE:	SHEET	9 OF 10



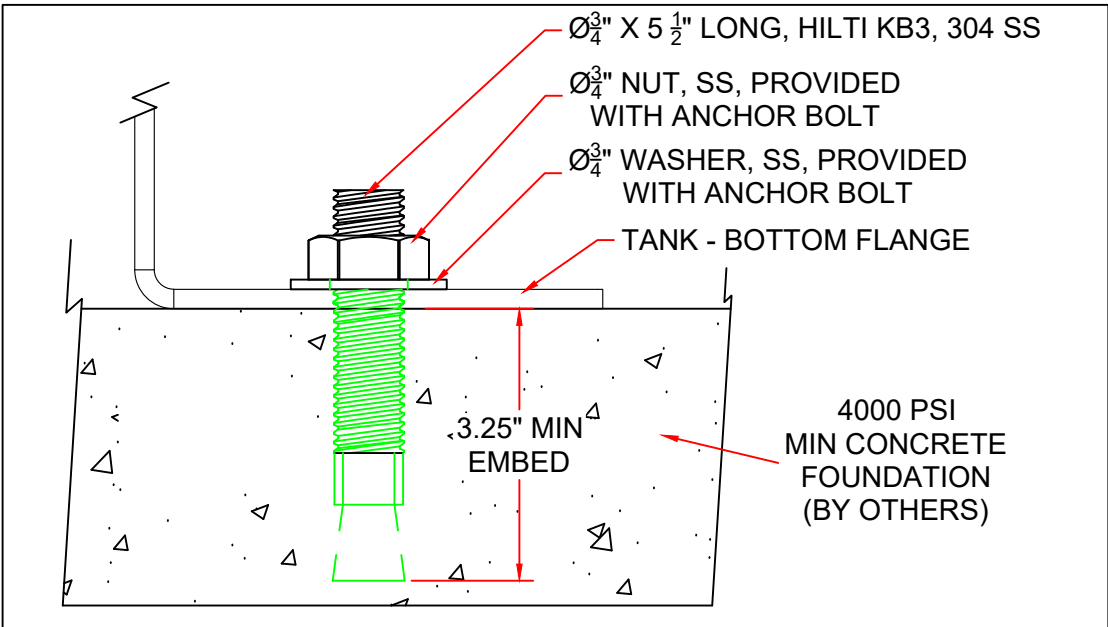
ENCLOSURE TO TANK

BOLT DETAIL



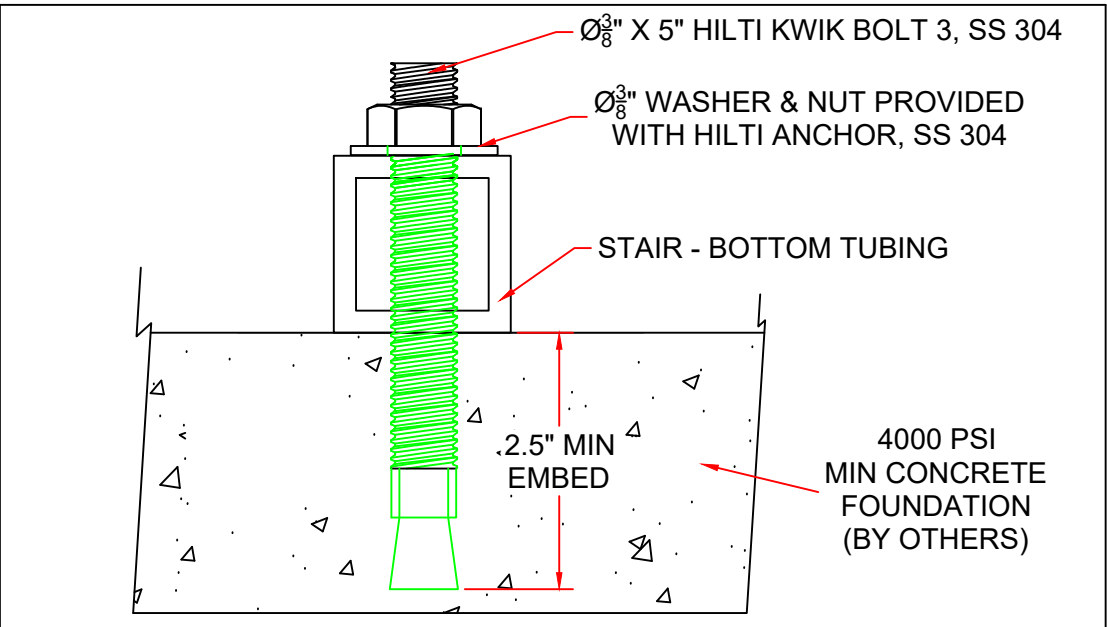
GENSET TO CHANNEL MOUNTING

BOLT DETAIL



TANK TO CONCRETE FOUNDATION

BOLT DETAIL



STAIR TO CONCRETE FOUNDATION

BOLT DETAIL

SUB-BASE WEIGHT	ENCL. WEIGHT	TANK WEIGHT	GENSET WEIGHT	TOTAL WEIGHT
0 LBS.	7,500 LBS.	20,400 LBS.	14,669 LBS.	42,569 LBS.

CUSTOMER:		 THIRD-ANGLE PROJECTION
RING POWER		
CAT C32 D1000 GC		
DESCRIPTION	ANCHOR DETAIL	
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER. FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.		DESIGNATION DL 2

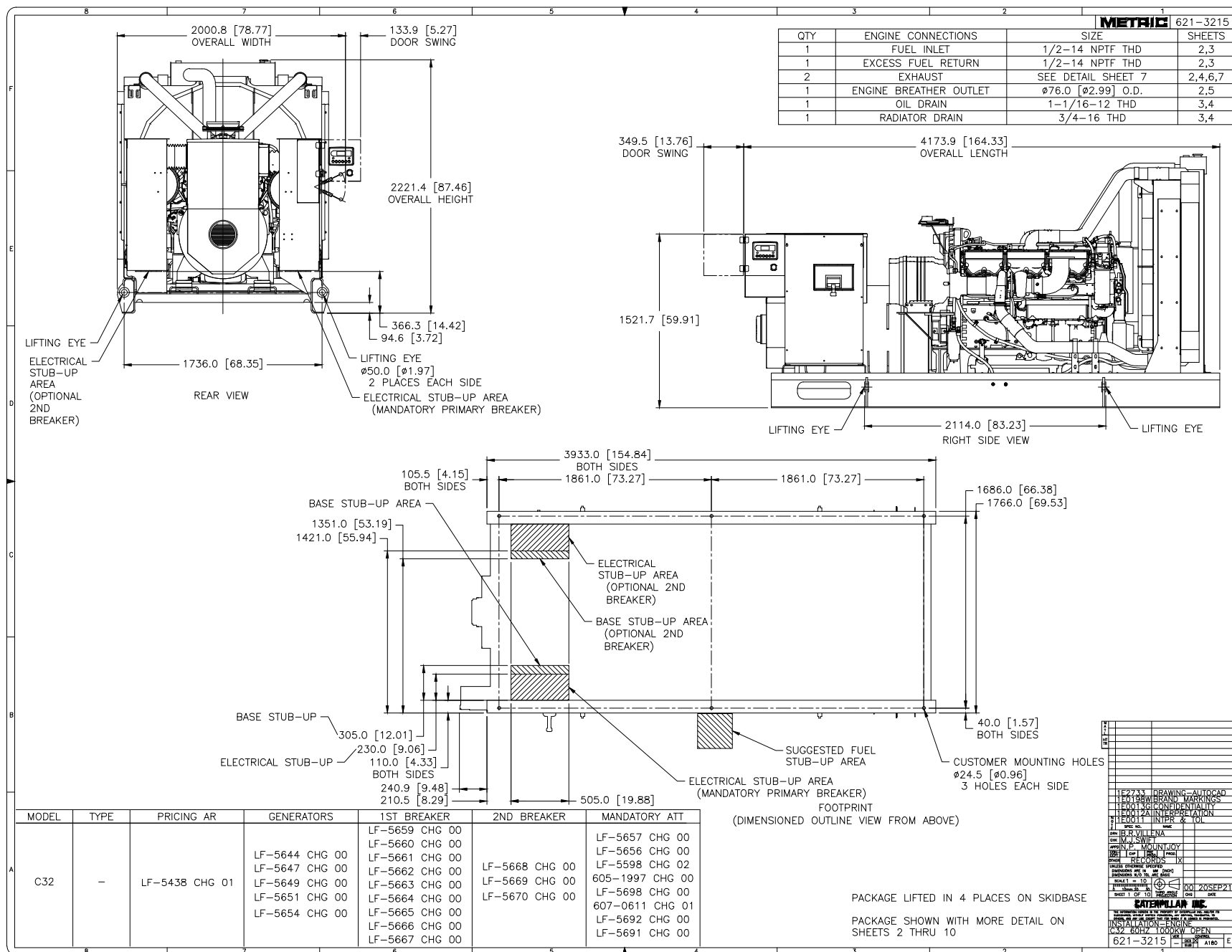


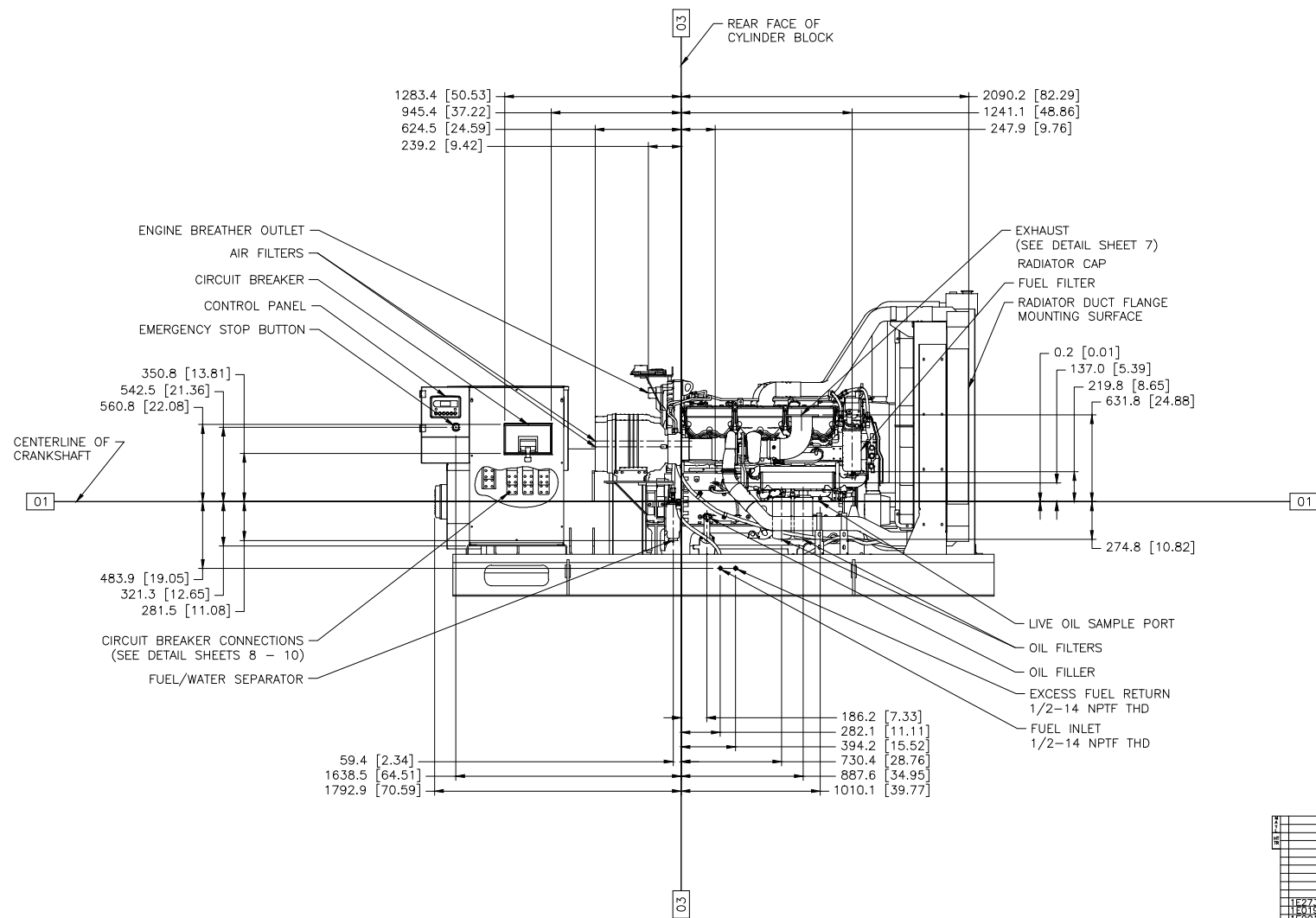
1900 NE 25TH AVE, OCALA, FL 34470
PHONE (352) 414-4700 FAX (352) 414-4642

OCOEE WTP (SOURCEWELL)

WO# 53770

DWG. BK	SCALE:	SHEET 10 OF 10
CHK. JAL		
APP. BJS		
DATE 11/29/2023		

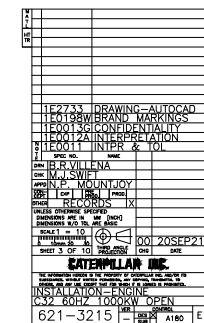




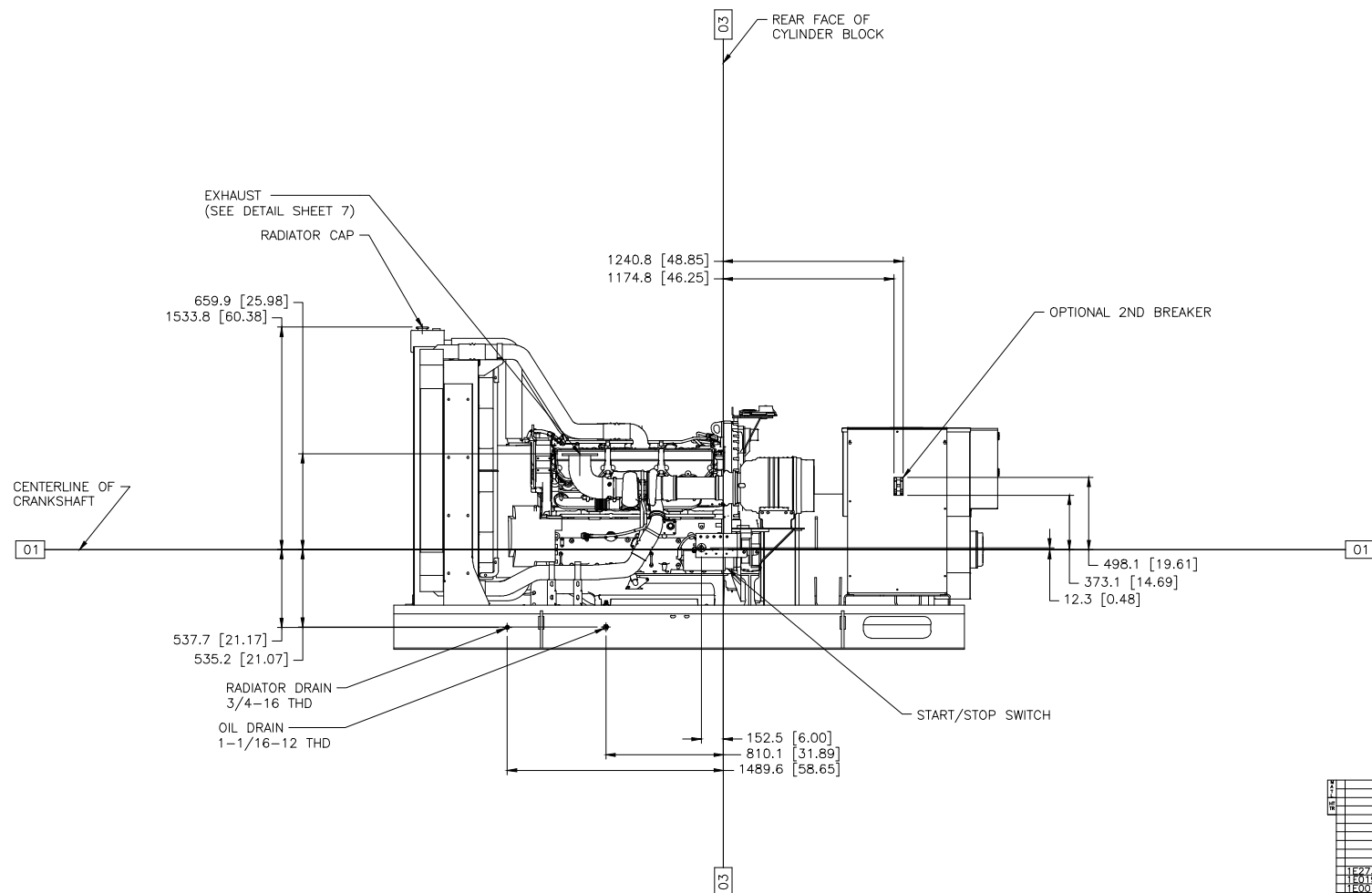
C32 60HZ 1000KW OPEN
DWG# 621-3215 CHG 00
METRIC [INCH]
RIGHT SIDE VIEW
LF-5438 CHG 01 W/ MANDATORY ATTACHMENTS SHOWN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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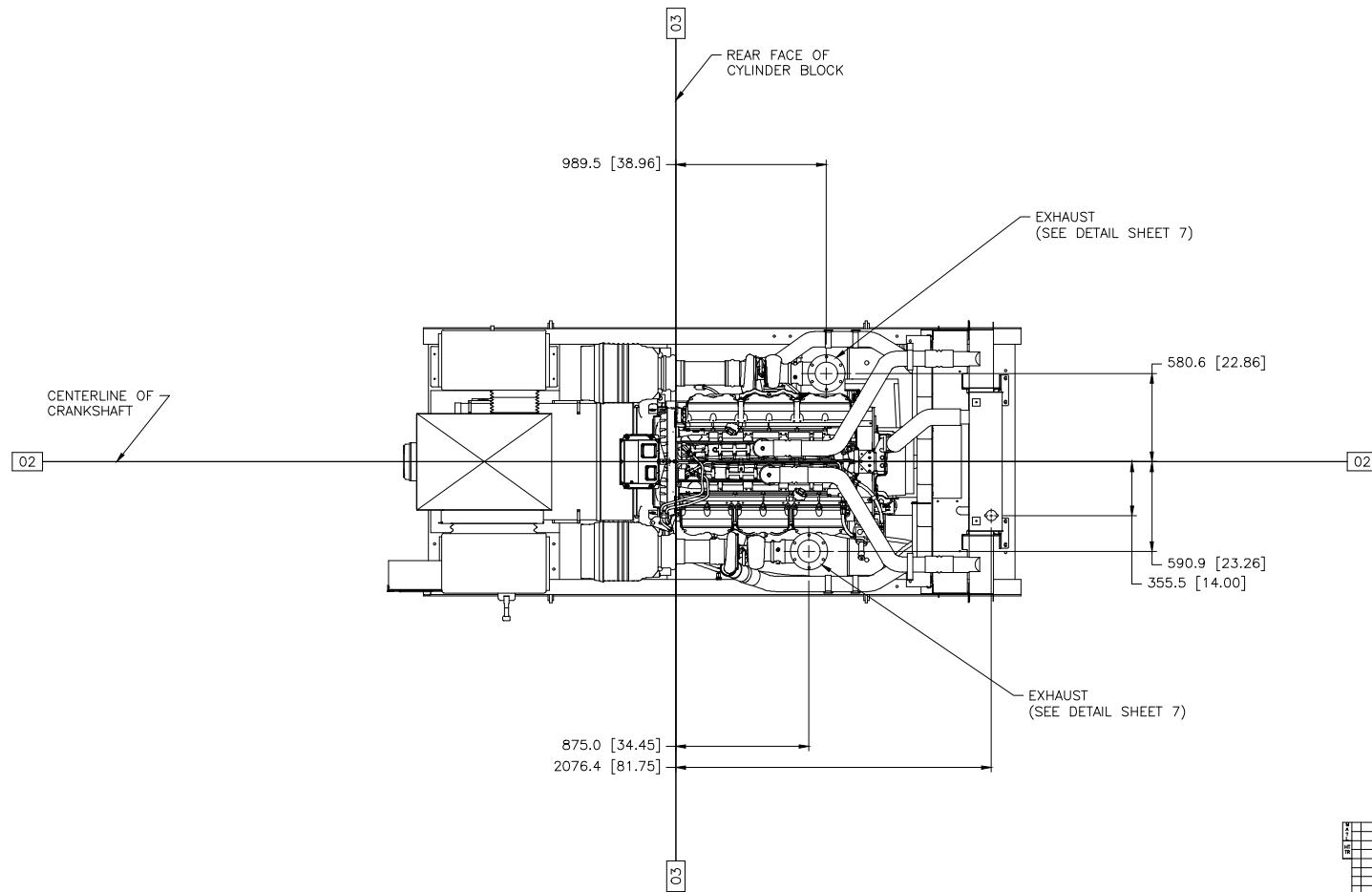


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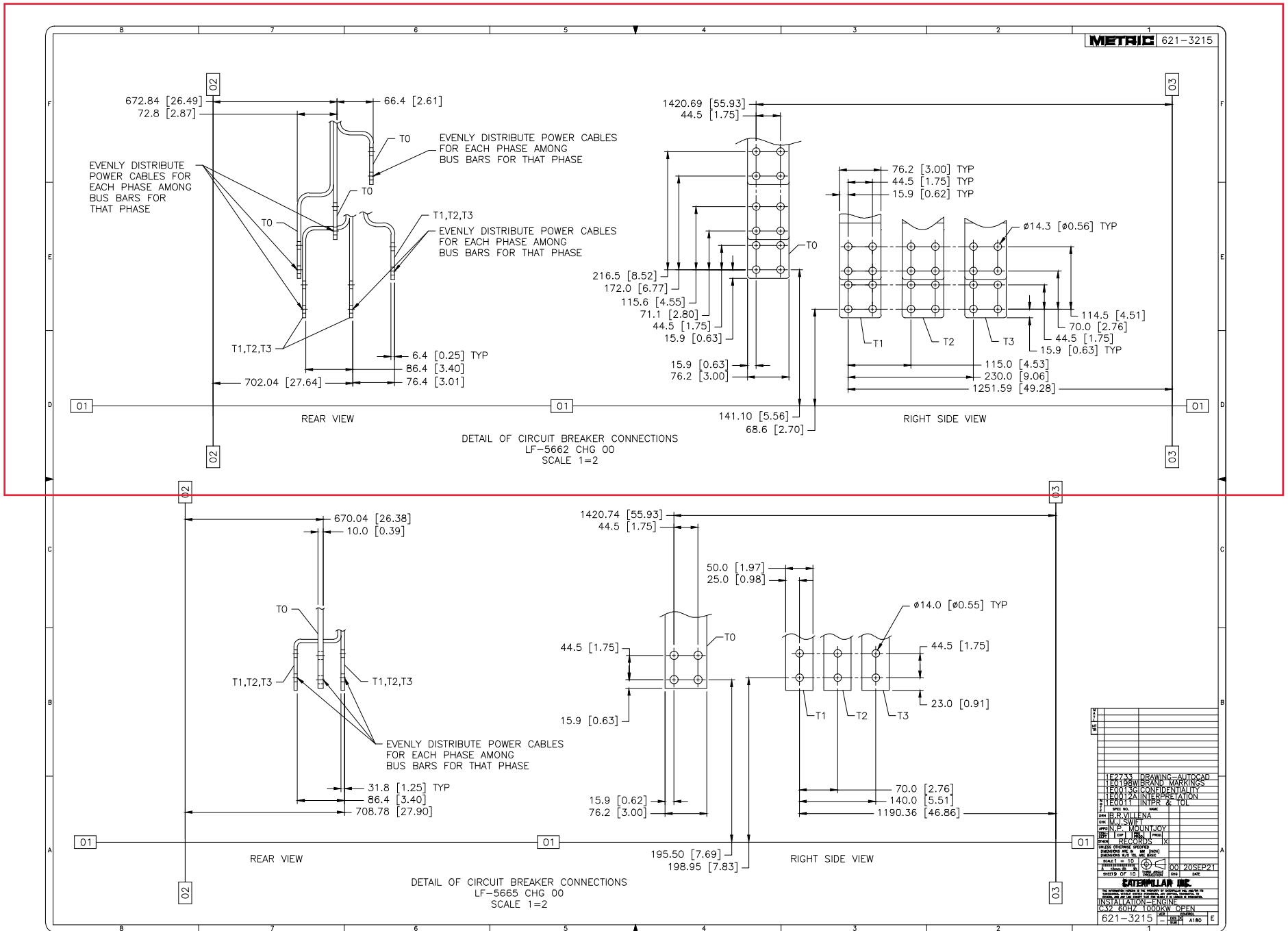
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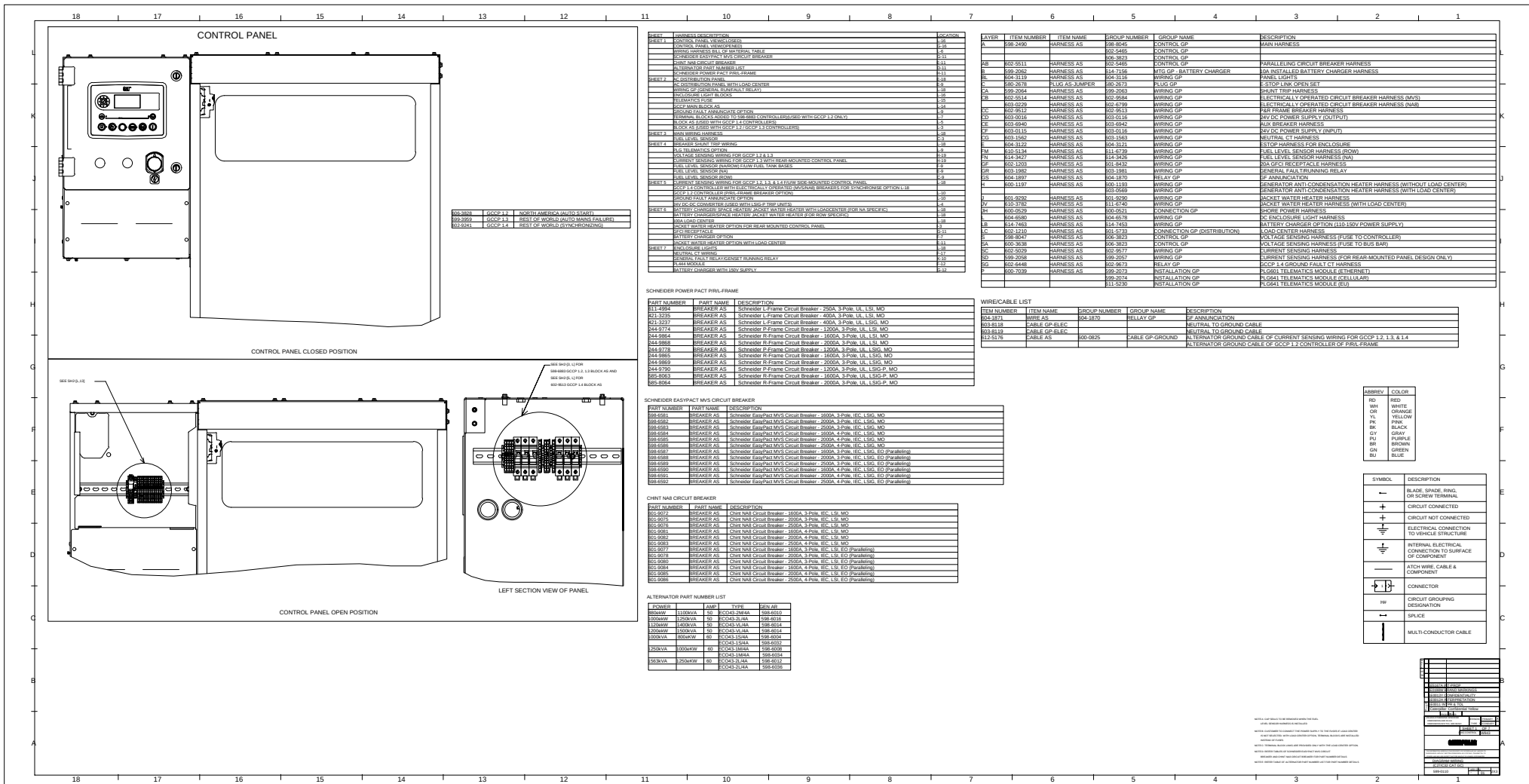
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 TOP VIEW
 LF-5438 CHG 01 W/ MANDATORY ATTACHMENTS SHOWN

7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224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ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)

ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)

ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)

ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)

POWER	VOLTS	TYPE	WIRE SIZE
100W	120V/240V	10	100-4010
100W	120V/240V	10	100-4010
100W	120V/240V	10	100-4010

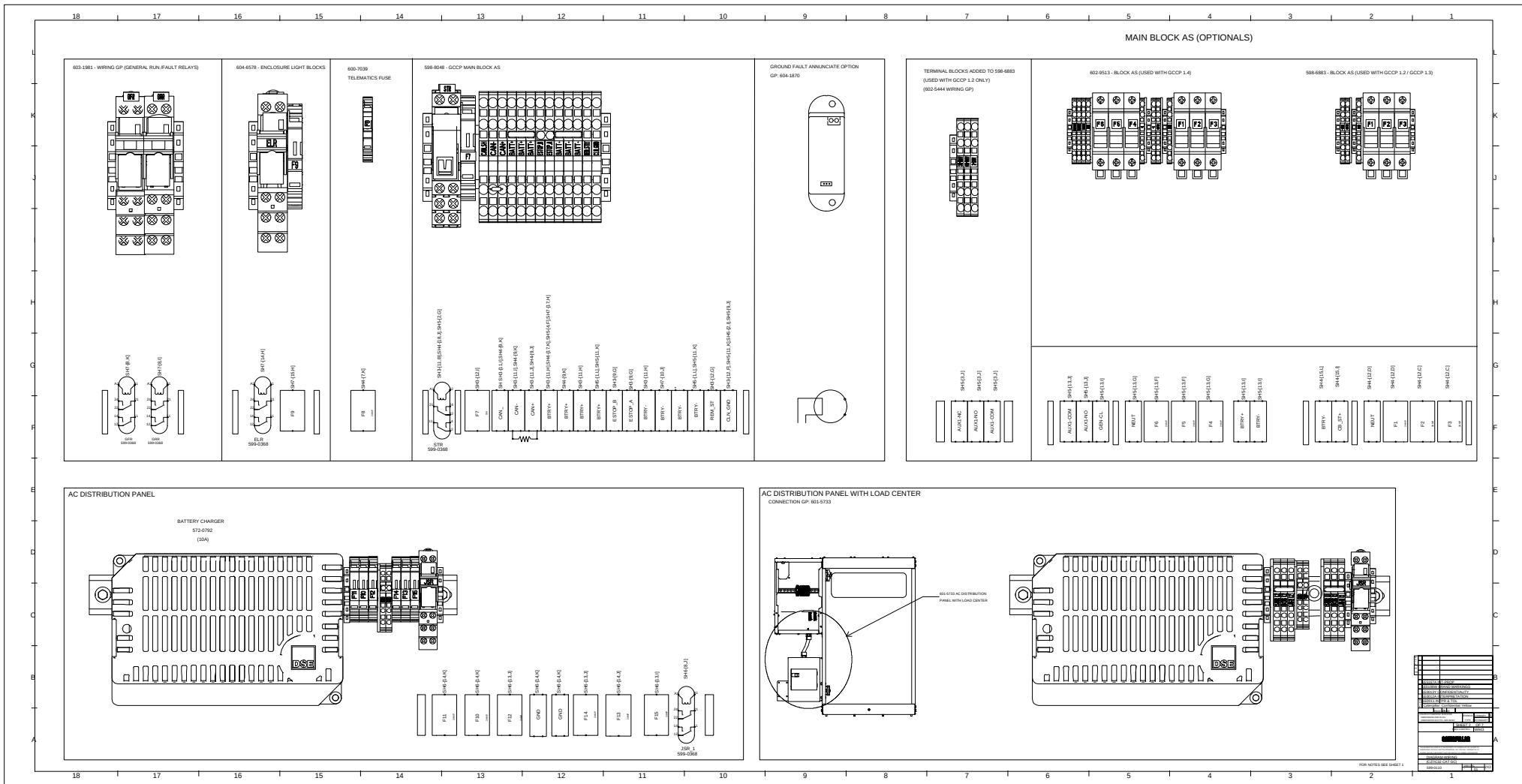
ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)

ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)

ABBREV	COLOR
RD	RED
WH	WHITE
OR	ORANGE
YL	YELLOW
BL	BLACK
PK	PINK
GR	GREEN
PU	PURPLE
BR	BROWN
BLU	BLUE

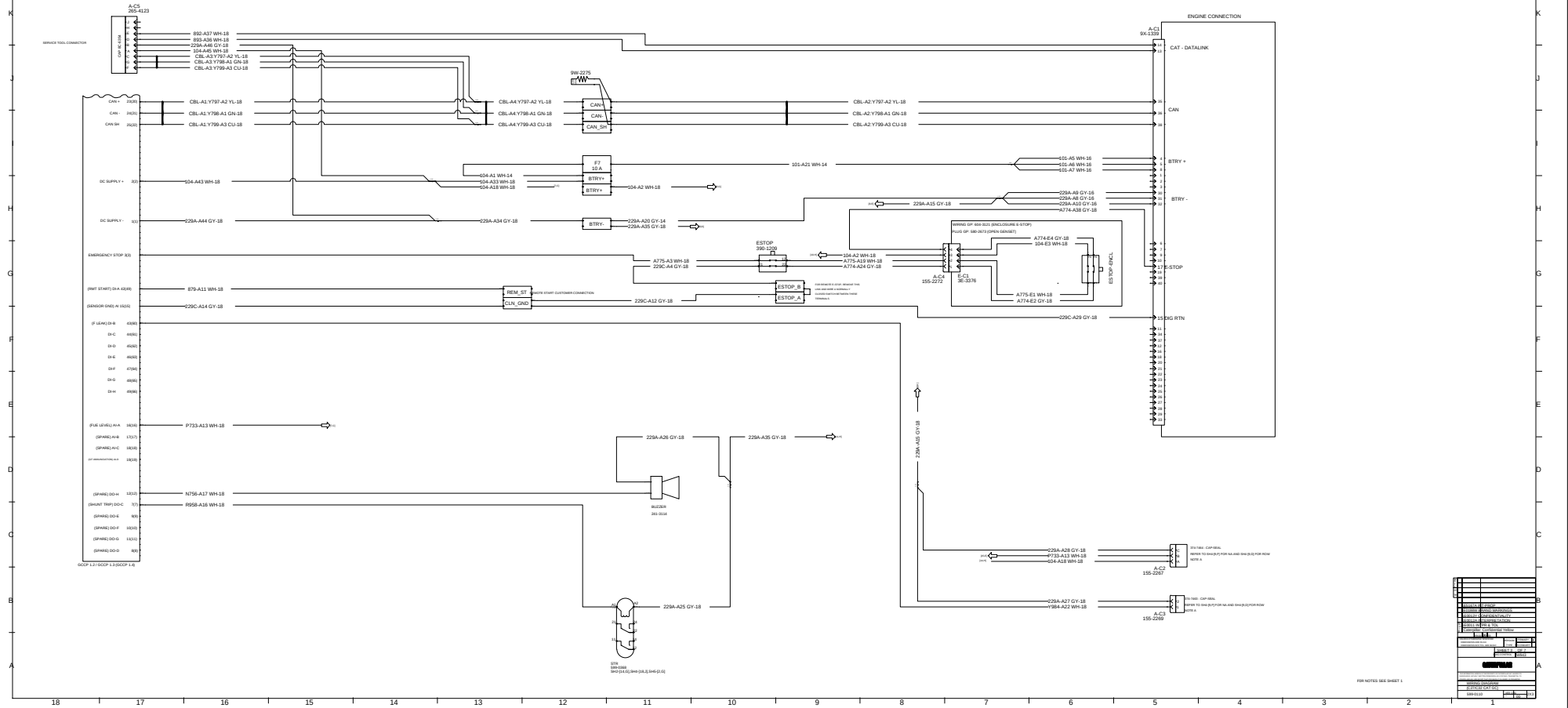
SYMBOL	DESCRIPTION
—	BLADE, SPADE, RING, OR SCREW TERMINAL
+	CIRCUIT CONNECTED
+	CIRCUIT NOT CONNECTED
+	ELECTRICAL CONNECTION TO VEHICLE STRUCTURE
+	INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
+	ATCH WIRE, CABLE & COMPONENT
+	CONNECTOR
+	CIRCUIT GROUPING DESIGNATION
+	SPLICE
+	MULTI-CONDUCTOR CABLE

ITEM NUMBER	ITEM NAME	GROUP NUMBER	GROUP NAME	DESCRIPTION
100-3800	GROUP 1.2	100-3800	GROUP 1.2	REST OF WORLD (AUTO START)
100-3801	GROUP 1.3	100-3801	GROUP 1.3	REST OF WORLD (AUTO START)
100-3802	GROUP 1.4	100-3802	GROUP 1.4	REST OF WORLD (AUTO START)



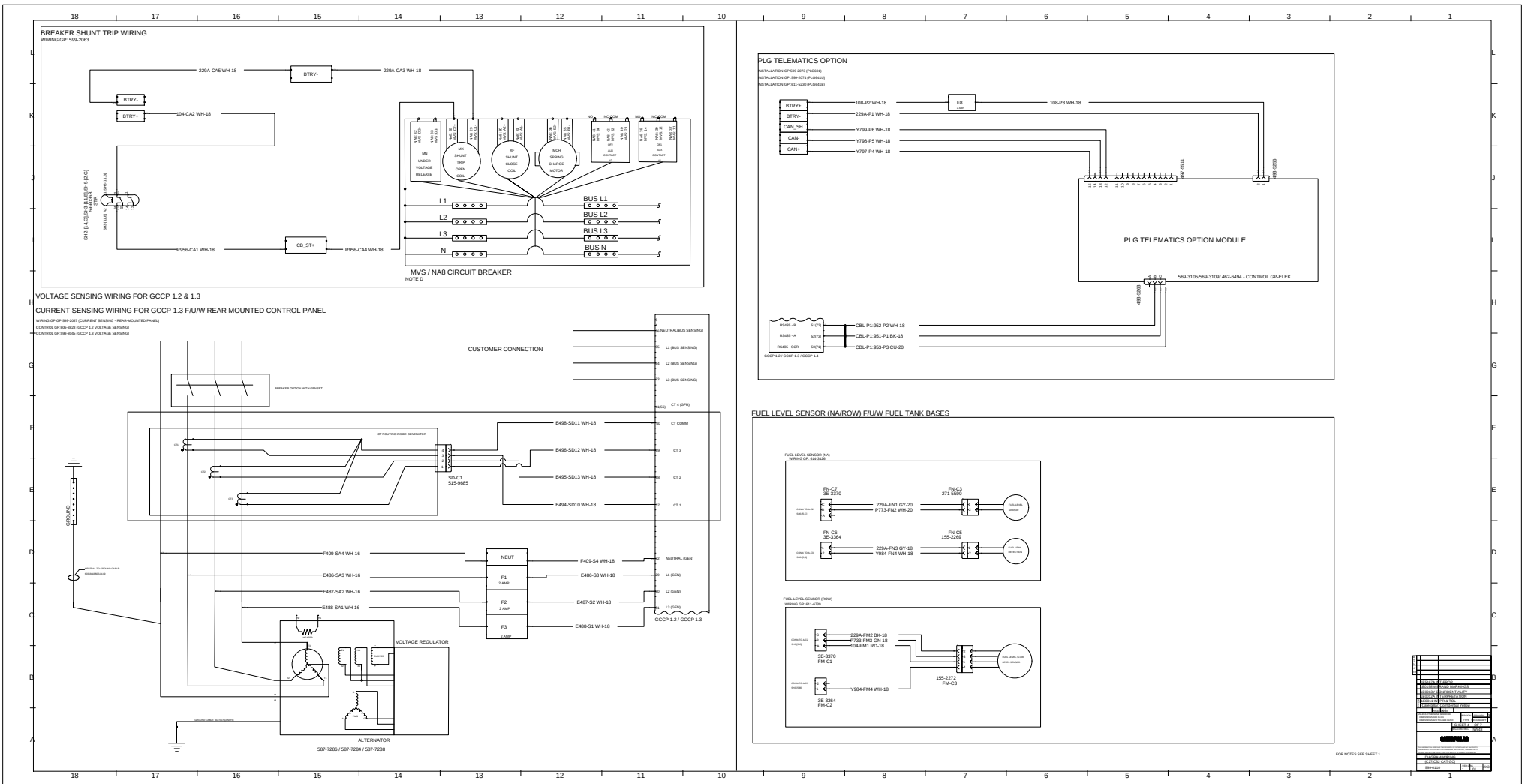
MAIN WIRING HARNESS

CONTROL GP: 588-8846
CONTROL GP: 602-5466
CONTROL GP: 606-3823



FOR NOTED SEE SHEET 1

NO.	DESCRIPTION	QTY	REMARKS
1	WIRING HARNESS	1	
2	WIRING HARNESS	1	
3	WIRING HARNESS	1	
4	WIRING HARNESS	1	
5	WIRING HARNESS	1	
6	WIRING HARNESS	1	
7	WIRING HARNESS	1	
8	WIRING HARNESS	1	
9	WIRING HARNESS	1	
10	WIRING HARNESS	1	
11	WIRING HARNESS	1	
12	WIRING HARNESS	1	
13	WIRING HARNESS	1	
14	WIRING HARNESS	1	
15	WIRING HARNESS	1	
16	WIRING HARNESS	1	
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[illegible]

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GENERAL INFORMATION



Department of Environmental Protection

2600 Blair Stone Road ♦ Tallahassee, Florida 32399-2400

DEP Form: 62-761.900(2)
Form Title: Storage Tank Facility Registration
Form
Effective Date: January 2017
Incorporated in Rule 62-761.400, F.A.C.

Storage Tank Facility Registration Form

Review Registration Instructions Before Completing this Form

Submit this completed form for the facility when registration of storage tanks or compression vessels is required by Chapter 376.303, Florida Statutes

Please check all that apply: ☐ New Registration ☐ New Owner ☐ New Tanks
☐ Existing Facility Info Update/Correction ☐ Existing Owner Info Update/Correction ☐ Existing Tank Info Update/Correction

A. FACILITY INFORMATION County: DEP Facility ID:

Facility Name:

Facility Address: City: Zip:

Facility Contact: Business Phone:

Facility Type(s): Financial Responsibility Mechanism (choose): ☐ Insurance ☐ Other

24 Hour Emergency Contact: **Emergency Phone:**

B. TANK OWNER INFORMATION: Identify individual(s) or Business(es) responsible for payment of Registration Fees at the facility location named above

Company/Individual Name: Ownership Effective Date:

Mail Address: STCM Account Number (if known):

City, State, Zip:

Contact Person:

Telephone: Email Address:

C. PROPERTY OWNER INFORMATION: Identify individual(s) or entity that if vested with ownership, dominion or legal or rightful title to the real property

Company/Individual Name: Ownership Effective Date:

Mail Address:

City, State, Zip:

Contact Person:

Telephone: Email Address:

D. TANK/VESSEL INFORMATION: Complete one row for each storage tank or compression vessel system located at this facility (see Registration Instructions for codes)

Tank ID	T or V	A or U	Capacity	Installation Date	Content Code	Status	Effective Date	Construction	Piping	Monitoring
1										
2										
3										
4										
5										
6										
7										
8										

Certified Contractor (performing UST installation or removal): DBPR License No.:

Facility Registration Certification: To the best of my knowledge and belief, all information submitted on this form is true, accurate and complete.

Signature

Date

Printed Name

Title

Submit this form to tankregistration@dep.state.fl.us

Florida Department of Environmental Protection

Bob Martinez Center • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Division of Waste Management - Storage Tank Facility Registration Form Registration Instructions and Codes List

Storage tank registration is available online through the DEP Business Portal in lieu of the paper form:

- *DEP Business Portal can be found:* <http://www.fldepportal.com/go/submit-registration>
- *Instructions on how to navigate the DEP Business Portal can be found on the DEP Registration web page:* <http://www.dep.state.fl.us/waste/categories/tanks/pages/registration.htm>

Storage Tank Facility Registration Form

In the first outlined section block, identify the types of information being submitted on the registration form.

[Forms 62-761.900(2) for USTs and 62-762.901(2) for ASTs. For facilities with both types of tanks, one form may be used].

Check **New Registration** when the **location** is being registered for the first time and no Facility Identification number exists. If submitting a revised Registration form, check all other boxes that apply to designate the type(s) of revisions being submitted.

A. Facility Information

- | | |
|-------------------------|---|
| County | List the county where the storage tank facility is located. |
| Facility ID | Include the DEP Facility Identification number whenever possible. Write in "Pending" when submitting a new registration for the first time. Remember: the facility ID number identifies the location, and it does not change even when a facility is transferred to a new owner upon sale of the facility. |
| Facility Name | Provide the current name of the business establishment operating at the facility location. When registering an abandoned facility, where tanks exist but there is no operational business, identify the location with the property owner's name, as in "Smith Property", if no other facility name is being used. |
| Facility Address | Include the street number and name. In a rural area with no street number associated with it, provide the parcel ID number along with directions (e.g., 'x' miles N of intersection...). Provide the name and telephone number of a contact person or manager <i>on location</i> , where possible. |
| Facility Type | This information is an explanation or term that most closely describes the operational use of the facility. Select the code(s) that provides the best or most appropriate description of the facility. |
1. If the facility is owned by a government entity, select the appropriate type from the following:

F. Federal Government	H. Local or City Government	N. Native Tribal Lands
G. State Government	I. County Government	
 2. If the facility meets the definition of "bulk product facility" - a waterfront location with at least one aboveground tank with a capacity greater than 30,000 gallons which is used for the storage of pollutants ("Pollutants" includes oil of any kind and in any form, gasoline, pesticides, ammonia, chlorine, and derivatives thereof, excluding liquefied petroleum gas"); select the type from:

T. Coastal bulk product facility - facility, as defined above and located on the Florida coast, may have storage tank systems that store hazardous substances in addition to pollutants. ("Coastline means the line of mean low water along the portion of the coast that is in direct contact with the open sea and the line marking the seaward limit of inland waters, as determined under the Convention on Territorial Seas and the Contiguous Zone, 15 U.S.T. (Pt. 2) 1606.").
S. Inland waterfront bulk product facility – a facility, as defined above and located on "inland waterways" (lakes, rivers), may have storage tank systems that store hazardous substances in addition to pollutants.
 3. When the facility is a "waterfront location", but not a *bulk product facility* as defined above, select the most appropriate type from:

V. Marine fueling facility - a commercial, recreational, or retail coastal facility that provides fuel to vessels and may store other pollutants and/or hazardous substances on site.
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Facility Type continued

- W.** Waterfront fueling facility - a commercial, recreational, or retail facility located on a non-coastal waterway that provides fuel to vessels and may store other pollutants and/or hazardous substances on site.
4. When the facility is not described as previously stated, select the most appropriate type from:
- A.** Retail Station - primarily supplies vehicular fuel to automotive customers; may store other regulated substances.
- C.** Fuel User, Non-retail - primarily stores motor fuel and/or other pollutants or hazardous substances for consumption by facility/owner/operator.
- D.** Inland Bulk Petroleum Storage - inland facility with no waterfront access, that has multiple active UST and/or AST storage systems used primarily for storage of pollutants intended for distribution. May also store hazardous substances on-site for facility consumption and/or distribution purposes.
- E.** Industrial Plant - inland facility with no waterfront access; may include power plants and facilities designed for manufacturing and/or chemical processing; may have multiple active UST and/or AST storage systems used for storage of pollutants and/or hazardous substances intended for facility consumption.
- J.** Collection Station - maintenance or other related facility that acquires and temporarily stores used and/or waste oil prior to recycling and/or disposal.
- K.** Inland Bulk Chemical Storage - inland facility with no waterfront access, that has multiple active UST and/or AST storage systems and/or compression vessels used for storage of hazardous substances intended for distribution. May also store pollutants on site for facility consumption and/or distribution purposes.
- L.** Chemical User - facility primarily uses regulated hazardous substance tanks on site; may also store pollutants.
- M.** Agricultural - facility actively used in production of crops, plants, or livestock.
- P.** UST Residential (>1100 gallons) - residence with USTs regulated by Federal Environmental Protection Agency.
- Z.** Other - Identify the type of establishment that you are registering.

Financial Responsibility — The demonstration of financial responsibility shall be made by the owner or operator in accordance with 40 CFR 280, Subpart H. Check box for Insurance or Other (includes all other financial responsibility methods).

24 Hour Emergency Contact - Provide the name and telephone number of the Emergency Contact for this facility.

B. Tank Owner Information

1. Provide the name, address, contact name, telephone number, and email address of the individual(s) and/or business(es) that are responsible for the operation of the storage tanks and for the payment of DEP annual Storage Tank Registration fees. The tank owner will also be associated with the role of Account Owner and will be given a STCM Account Number. The Account Owner is responsible for payment of the annual storage tank registration fees, and will receive the annual storage tank registration placard(s) upon payment.
2. When submitting revisions to owner name or address information, please include their STCM Account Number, when available.
3. Submit a registration form when the tank ownership changes, complete with the date and new account owner's signature.

C. Property Owner Information

1. Provide the name, address, contact name, telephone number, and email address of the individual(s) and/or business(es) that are vested with ownership, dominion or legal or rightful title to the real property.
2. Submit a registration form when the property ownership changes, complete with the date.

D. Tank/Compression Vessel Information - Complete one row in Section D for each storage tank and/or compression vessel system located at the facility. Use the following system description codes where appropriate.

1. **Tank ID** – number the systems sequentially, or provide a unique ID number; do not use symbols (#, %, -, etc.).
2. **Tank or Vessel Indicator** – choose T or V to describe the system type.
3. **Tank Placement** – choose A or U to designate aboveground or underground placement of the system.
4. **Tank Capacity** – enter the storage tank capacity in gallons.
5. **Installation Date** – record the date of installation in ‘MM/YY’ format; provide a best estimate if unknown.
6. **Tank Content** – record the current content (or last content, if system is closed or out-of-service) from the list below:

A	Leaded Gasoline	K	Kerosene	U	Mineral Acid*
B	Unleaded Gasoline (No Ethanol)	L	Waste Oil	V	Grades 5 & 6 bunker “C” residual oils
D	Vehicular Diesel	M	Fuel Oil: on-site heating only; USTs or ASTs < 30K gals^	W	Petroleum-based additive product
E	Aviation Gasoline	N	Fuel Oil: distribution; or on-site heating - ASTs > 30K gals‡	X	Miscellaneous petroleum-based product
F	Jet Fuel	O	New and Lube Oil	Y	Unknown Substance
G	Diesel Fuel-Emergency Generator	Q	Pesticide	Z	Other Substance (please identify)
H	Diesel Fuel-Generator or Pump	R	Ammonia Compound	7	Biodiesel (B20)
I	Diesel Fuel-Ultra Low Sulfur	S	Chlorine Compound	8	E10 – blend of 10% ethanol/90% gasoline
J	Used Oil	T	Hazardous Substance (CERCLA)	9	E85 – blend of 85% ethanol/15% gasoline

* Mineral Acid = Hydrobromic acid, Hydrochloric acid, Hydrofluoric acid, Phosphoric acid and Sulfuric acid.

^ M = fuel is used solely to heat the facility premises and must be stored in a tank with capacity < 30,000 gallons; exempt from regulation.

‡ N = fuel is distributed as heating fuel, or fuel is used solely to heat the facility premises, but the storage tank capacity exceeds 30,000 gallons.

** Compartmented tanks – register as a single tank; itemize the size and contents of each compartment. See construction miscellaneous attributes.

** Manifold tanks – register as individual storage tanks; with individual size and content – even though they are “connected”.

7. **Status** – record the current status of the system, and the status effective date (or best estimate) in ‘MM/YY’ format. Update the tank status timely, as necessary for tanks moving between “in service” and “out of service” status.
 - A. Properly closed in-place UST filled with sand, concrete or other inert material; AST rendered unusable.
 - B. Removed from the site.
 - D. Deleted – Data Error – Added to STCM in error; may be a duplicate tank (and/or facility), or tank was registered prior to installation and decided not to have tank installed.
 - E. Construction modified – AST constructed as a “mobile tank” or enclosed in a building; no longer retains a “regulated” status.
 - M. Moved to New Site – Designation that identifies a tank as removed from a particular facility and reinstalled at a second facility.
 - T. Out-of-service tank – Tank system that is designated as out-of-service by the owner or operator.
 - U. In-service – Tank system that is NOT designated as out-of-service by the owner or operator.
 - V. Temporary out-of-service – Field erected storage tank system that is designated as temporary out-of-service by the owner or operator.
 - W. Non-regulated use/process – Exempt from regulation due to how the tank or substance is used; i.e. tank stores diesel used in FLOWTHROUGH process.
 - Z. Non-regulated product – Stored in tank; provide status effective date when status relates to a ‘change in product’ from a regulated substance to a non-regulated substance for a particular storage tank.
 8. Construction, Piping, and Monitoring Attributes – Select from the lists below, the codes that best describe the attributes of each storage tank system.

CONSTRUCTION

Primary Construction:	C Steel	X Concrete
	D Unknown	Y Polyethylene
	E Fiberglass	Z Other DEP approved protection method
	F Fiberglass-clad steel	
Overfill/Spill:	A Ball check valve	O Tight fill
	M Spill containment bucket	P Level gauges, high-level alarms
	N Flow shut-off	Q Other DEP approved protection method
Corrosion Protection	G Cathodic protection – sacrificial anode	H Cathodic protection – impressed current
Secondary Containment	I Double-walled construction: single material (outer tank material same as inner tank material)	
	R Double-walled construction: dual material (outer tank – concrete, approved synthetic material, or tank “jacket”)	
	J Synthetic liner in tank excavation	
	K Concrete, synthetic material, and/or off-site clays beneath AST and in containment area	
	S Other DEP approved/registered containment system	
Construction: Miscellaneous Attributes	B Internal Lining	U Field Erected
	L Compartmented	W Built on supports

PIPING

Primary Construction	B Steel or Galvanized Metal	X No piping associated with tank
	C Fiberglass	Y Unknown
	N Approved Synthetic Material	Z Other DEP approved piping material
Corrosion Protection	D External Protective Coating	
	E Cathodically Protected with Sacrificial Anode or Impressed Current	
Secondary Containment	F Double-walled construction: single material (outer pipe material same as inner pipe material)	
	M Double-walled construction: dual material (outer pipe approved synthetic material or pipe “jacket”)	
	G Synthetic liner or box/trench liner in piping excavation or pipe containment area	
	P Internal Piping: contained within an internal sump riser directly connected to tank and located beneath dispenser	
Piping: Miscellaneous Attributes	A Aboveground – no contact with soil	K Dispenser Sumps
	I Suction Piping System	L Bulk Product System
	J Pressurized Piping System	H Airport/Seaport Hydrant System
	W Piping over water	

MONITORING

External	E Monitoring of UST synthetic liner	W Fiber-optics Technologies
	Q Visual Inspection of AST Systems	Z Other DEP approved monitoring methods
	8 Manually Sampled Wells	
Internal	F Interstitial Space – Double-walled Tank	
	R Interstitial Monitoring of AST Tank Bottom	
Piping Monitoring	G Electronic Line Leak Detector with Flow Shutoff	K Interstitial Monitoring – Double-walled Piping
	H Mechanical Line Leak Detector	U Bulk Product Piping Pressure Test
	J Monitoring of Piping Liner	6 External Monitoring
Miscellaneous	I Not Required – See Rule for Exemptions	3 Electronic Monitoring of Piping Sumps
	Y Unknown	4 Visual Inspections of Dispenser Sumps
	1 Continuous Electronic Sensing Equipment	5 Electronic Monitoring of Dispenser Sumps
	2 Visual Inspections of Piping Sumps	

E. Certified Contractor and Certification

Record the name and the ***Department of Business and Professional Regulation License Number*** for the ***Certified Contractor*** whenever an underground storage tank has been installed or removed. Do not rely on the contractor to file this form. Storage Tank Registration Forms are required to be submitted by the storage tank system owner.

Please Remember - The Registration Form cannot be processed without the name and signature of the storage tank system owner and the date of the form submittal. Please print the name legibly in case a representative of the storage tank program should need to contact you.

Submit form to tankregistration@dep.state.fl.us

If you have questions, please call a storage tank registration representative at (850) 245-8839 or email tankregistration@dep.state.fl.us for assistance. Thank you for your cooperation.

DIVISION OF RESPONSIBILITIES

CONTRACTOR'S RESPONSIBILITIES

EQUIPMENT DELIVERY

- Ring Power will provide delivery to jobsite ONLY. Offloading, including cranes, rigging and spreader bars are the contractor's responsibility.
- Equipment shall be delivered at one time. Additional deliveries for items such as transfer switches may be subject to additional charges.
- Deliveries shall be made on weekdays during regular business hours. Special delivery arrangements can be made, but may be subject to additional charges.

INSTALLATION

- FOUNDATION
 - Equipment shall be set on a foundation designed and constructed according to load requirements and soil conditions.
 - Vibration isolators, if applicable, must be adjusted prior to piping/wiring interconnection.
- WIRING
 - Supply and terminate all interconnecting control wiring between generator set, automatic transfer switch, battery charger, fuel tank, etc.
 - Control wiring shall be stranded conductor.
 - Supply and terminate load cables. Lugs are not provided unless specifically called out.
 - Supply and terminate AC power to AC powered accessories. Power must be available, but this equipment should not be energized prior to arrival of Ring Power personnel.
 - Control wiring must be run in separate conduit from power wiring.
- FUEL SYSTEM
 - Provide an adequate supply of high quality fuel for start up and load bank testing. Fuel shall be low sulfur #2 diesel fuel.

START-UP PROCEDURE

- Request start-up by completing and faxing the Request for Start-Up Checklist included with this submittal. Completion of the Request for Start-Up Checklist is mandatory prior to scheduling start-up.
- Scheduling start-up will require at least one (1) week after completion of the Request for Start-Up Checklist.
- Start-up activities shall be limited to those specified or those included in Caterpillar start-up procedures. Exception is taken to any specifications that are contradictory or in conflict with Caterpillar or Ring Power procedures and guidelines.
- Additional visits, delays or extensions of standard start-up activities due to incomplete site preparation will result in additional charges.
- Additional visits, delays or extensions of standard start-up activities due to failure of equipment outside of Ring Power's scope will result in additional charges.
- Start-up shall be performed on weekdays during regular business hours. Special start-up arrangements are available with advance notice and at additional charges.

RING POWER'S RESPONSIBILITIES

EQUIPMENT DELIVERY

- Provide delivery to jobsite – offloading by others.

INSTALLATION

- Provide engineering of all equipment provided in Ring Power's Scope of Supply, including design information and submittal drawings.
- Provide installation and engineering support.
- Provide Operation and Maintenance Manual(s) upon completion of testing. Allow two weeks minimum for completion of Operation and Maintenance Manual(s) after start-up has been completed.
- Ring Power will provide the manual quantities listed on the Sales Quote.

START-UP

- Schedule start-up upon receipt of the Request for Start-Up Checklist.
- Start-up shall be performed on weekdays during regular business hours. Special start-up arrangements are available with advance notice and at additional charges.
- Inspect all interconnecting control wiring.
- Inspect load cable termination.
- Inspect AC power terminations and authorize contractor to energize the AC powered options.
- Inspect fuel system installation.
- Inspect exhaust system installation.
- Perform start-up per Caterpillar Start-Up Procedures and Specifications. Exception is taken to any specifications that are contradictory or in conflict with Caterpillar or Ring Power procedures or guidelines.
- Check all control functions and safeties and verify system performance.
- Perform load test if called out in sales documents.
- Conduct training session with owner's representative.

REQUEST FOR START-UP CHECKLIST

JOB NO: 230752

JOB NAME: Ocoee WTP

START-UP PROCEDURE IS AS FOLLOWS:

1. COMPLETE AND EMAIL THIS "REQUEST FOR START-UP CHECKLIST"
TO George Soha, PROJECT MANAGER, AT
2. george.soha@ringpower.com, OR FAX TO (407) 438-0922.
UPON RECEIPT, START-UP WILL BE SCHEDULED. PLEASE ALLOW AT LEAST ONE WEEK'S NOTICE
FOR SCHEDULING.

**PLEASE CONFIRM THAT THE FOLLOWING ARE COMPLETED. ALL ITEMS BELOW MUST BE COMPLETED
PRIOR TO REQUESTING START-UP.**

CUSTOMER RESPONSIBILITY:

- _____ COMMERCIAL POWER AVAILABLE AND TERMINATED AT TRANSFER SWITCH
- _____ POWER CABLES TERMINATED AT GENERATOR SET AND TRANSFER SWITCH
- _____ LOAD CABLES FROM BUILDING TERMINATED AT TRANSFER SWITCH
- _____ CONTROL WIRING TERMINATED AT GENERATOR SET AND TRANSFER SWITCH
- _____ REMOTE ALARM MODULE WIRING IS TERMINATED AT BOTH ENDS
- _____ FUEL SYSTEM INSTALLED AND CONNECTED
- _____ ADEQUATE SUPPLY OF GOOD QUALITY FUEL
- _____ EXHAUST SYSTEM INSTALLED AND CONNECTED
- _____ CUSTOMER SUPPLIED CIRCUIT FOR GENERATOR ACCESSORIES TERMINATED AT GENERATOR
SET (*DO NOT APPLY POWER UNTIL VERIFIED BY RING POWER REPRESENTATIVE*)

****NOTE**** ALL SUPPORT EQUIPMENT MUST BE ON A CRITICAL CIRCUIT.
DO NOT ENERGIZE SUPPORT ITEMS UNTIL THEY HAVE BEEN INSPECTED
FOR PROPER CONNECTION BY A RING POWER REPRESENTATIVE.

PLEASE PROVIDE THE FOLLOWING INFORMATION:

JOBSITE CONTACT: _____

JOBSITE PHONE NUMBER: _____

JOBSITE FAX NUMBER: _____

FORM COMPLETION DATE: _____

REQUESTED START-UP DATE: _____

GEORGE SOHA
PROJECT MANAGER
ELECTRIC POWER
(407) 472-6272 | (407) 438-0922 FAX
george.soha@ringpower.com

Effective with sales to the first user on or after August 1, 2016

CATERPILLAR LIMITED WARRANTY

Industrial, Petroleum, Locomotive, and Agriculture Engine Products and Electric Power Generation Products

Worldwide

Caterpillar Inc. or any of its subsidiaries ("Caterpillar") warrants new and remanufactured engines and new and rebuild electric power generation products sold by it (including any products of other manufacturers packaged and sold by Caterpillar), to be free from defects in material and workmanship.

This warranty does not apply engines sold for use in on-highway vehicle or marine applications; engines in machines manufactured by or for Caterpillar; C175, 3500 and 3600 series engines used in locomotive applications; 3000 Family engines, C0.5 through C4.4 and ACERT™ (C6.6, C7, C7.1, C9, C9.3, C11, C13, C15, C18, C27, and C32) engines used in industrial, mobile agriculture and locomotive applications; or Cat[®] batteries; or Electric Power Generation Products manufactured or assembled in India. These products are covered by other Caterpillar warranties.

This warranty is subject to the following:

Warranty Period

- For industrial engines, engines in a petroleum applications or Petroleum Power Systems (excluding petroleum fire pump application), or engines in a Locomotive application, or Uninterruptible Power Supply (UPS) systems, the warranty period is 12 months after date of delivery to the first user.
- For engines used in petroleum fire pump and mobile agriculture applications the warranty period is 24 months after date of delivery to the first user.
- For controls only (EPIC), configurable and custom switchgear products, and automatic transfer switch products, the warranty period is 24 months after date of delivery to the first user.
- For new CG132, CG170 and CG260 series power generation products the warranty period is 24 months/16,000 hours, whichever comes first, after date of delivery to first user.
- For electric power generation products other than CG132, CG170 and CG260 series in prime or continuous applications the warranty period is 12 months. For standby applications the warranty period is 24 months/1000 hours. For emergency standby applications the warranty period is 24 months/400 hours. All terms begin after date of delivery to the first user.
- For Caterpillar rebuild electric power generation products the warranty period is 12 months, but not to exceed 24 months from shipment of rebuilt electric power generation product from Caterpillar.
- For all other applications the warranty period is 12 months after date of delivery to the first user.

Caterpillar Responsibilities

If a defect in material or workmanship is found during the warranty period, Caterpillar will, during normal working hours and at a place of business of a Cat dealer or other source approved by Caterpillar:

- Provide (at Caterpillar's choice) new, Remanufactured, or Caterpillar approved repaired parts or assembled components needed to correct the defect.
- Note:** New, remanufactured, or Caterpillar approved repaired parts or assembled components provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product in which installed as if such parts were original components of that product. Items replaced under this warranty become the property of Caterpillar.
- Replace lubricating oil, filters, coolant, and other service items made unusable by the defect.
- Provide reasonable and customary labor needed to correct the defect, including labor to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems, if required.

For new 3114, 3116, and 3126 engines and, new and Caterpillar rebuild electric power generation products (which includes the following: any new products of other manufacturers packaged and sold by Caterpillar)

- Provide travel labor, up to four hours round trip, if in the opinion of Caterpillar, the product cannot reasonably be transported to a place of business of a Cat dealer or other source approved by Caterpillar (travel labor in excess of four hours round trip, and any meals, mileage, lodging, etc. is the user's responsibility).

For all other products:

- Provide reasonable travel expenses for authorized mechanics, including meals, mileage, and lodging, when Caterpillar chooses to make the repair on-site.

User Responsibilities

The user is responsible for:

- Providing proof of the delivery date to the first user.
- Labor costs, except as stated under "Caterpillar Responsibilities," including costs beyond those required to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems.

- Travel or transporting costs, except as stated under "Caterpillar Responsibilities."
- Premium or overtime labor costs.
- Parts shipping charges in excess of those that are usual and customary.
- Local taxes, if applicable.
- Costs to investigate complaints, unless the problem is caused by a defect in Caterpillar material or workmanship.
- Giving timely notice of a warrantable failure and promptly making the product available for repair.
- Performance of the required maintenance (including use of proper fuel, oil, lubricants, and coolant) and items replaced due to normal wear and tear.
- Allowing Caterpillar access to all electronically stored data.

Limitations

Caterpillar is not responsible for:

- Failures resulting from any use or installation that Caterpillar judges improper.
- Failures resulting from attachments, accessory items, and parts not sold or approved by Caterpillar.
- Failures resulting from abuse, neglect, and/or improper repair.
- Failures resulting from user's delay in making the product available after being notified of a potential product problem.
- Failures resulting from unauthorized repairs or adjustments, and unauthorized fuel setting changes.
- Damage to parts, fixtures, housings, attachments, and accessory items that are not part of the engine, Cat Selective Catalytic Reduction System or electric power generation product (including any products of other manufacturers packaged and sold by Caterpillar).
- Repair of components sold by Caterpillar that is warranted directly to the user by their respective manufacturer. Depending on type of application, certain exclusions may apply. Consult your Cat dealer for more information.

(Continued on reverse side...)

This warranty covers every major component of the products. Claims under this warranty should be submitted to a place of business of a Cat dealer or other source approved by Caterpillar. For further information concerning either the location to submit claims or Caterpillar as the issuer of this warranty, write Caterpillar Inc., 100 N. E. Adams St., Peoria, IL USA 61629.

Caterpillar's obligations under this Limited Warranty are subject to, and shall not apply in contravention of, the laws, rules, regulations, directives, ordinances, orders, or statutes of the United States, or of any other applicable jurisdiction, without recourse or liability with respect to Caterpillar.

A) For products operating outside of Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

NEITHER THE FOREGOING EXPRESS WARRANTY NOR ANY OTHER WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED, IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT CATERPILLAR EMISSION-RELATED COMPONENTS WARRANTIES FOR NEW ENGINES, WHERE APPLICABLE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISION OF MATERIAL AND SERVICES, AS SPECIFIED HEREIN.

CATERPILLAR IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.

For personal or family use engines or electric power generation products, operating in the USA, its territories and possessions, some states do not allow limitations on how long an implied warranty may last nor allow the exclusion or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary by jurisdiction. To find the location of the nearest Cat dealer or other authorized repair facility, call (800) 447-4986. If you have questions concerning this warranty or its applications, call or write:

In USA and Canada: Caterpillar Inc., Engine Division, P. O. Box 610, Mossville, IL 61552-0610, Attention: Customer Service Manager, Telephone (800) 447-4986. Outside the USA and Canada: Contact your Cat dealer.

B) For products operating in Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

THIS WARRANTY IS IN ADDITION TO WARRANTIES AND CONDITIONS IMPLIED BY STATUTE AND OTHER STATUTORY RIGHTS AND OBLIGATIONS THAT BY ANY APPLICABLE LAW CANNOT BE EXCLUDED, RESTRICTED OR MODIFIED ("MANDATORY RIGHTS"). ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED (BY STATUTE OR OTHERWISE), ARE EXCLUDED. WITHOUT LIMITING THE FOREGOING PROVISIONS OF THIS PARAGRAPH, WHERE A PRODUCT IS SUPPLIED FOR BUSINESS PURPOSES, THE CONSUMER GUARANTEES UNDER THE CONSUMER GUARANTEES ACT 1993 (NZ) WILL NOT APPLY.

NEITHER THIS WARRANTY NOR ANY OTHER CONDITION OR WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED (SUBJECT ONLY TO THE MANDATORY RIGHTS), IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

IF THE MANDATORY RIGHTS MAKE CATERPILLAR LIABLE IN CONNECTION WITH SERVICES OR GOODS, THEN TO THE EXTENT PERMITTED UNDER THE MANDATORY RIGHTS, THAT LIABILITY SHALL BE LIMITED AT CATERPILLAR'S OPTION TO (a) IN THE CASE OF SERVICES, THE SUPPLY OF THE SERVICES AGAIN OR THE PAYMENT OF THE COST OF HAVING THE SERVICES SUPPLIED AGAIN AND (b) IN THE CASE OF GOODS, THE REPAIR OR REPLACEMENT OF THE GOODS, THE SUPPLY OF EQUIVALENT GOODS, THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT GOODS.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

CATERPILLAR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNLESS IMPOSED UNDER MANDATORY RIGHTS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.

C) For products supplied in Australia:

IF THE PRODUCTS TO WHICH THIS WARRANTY APPLIES ARE:

I. PRODUCTS OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION; OR

II. PRODUCTS THAT COST AUD 40,000 OR LESS,

WHERE THOSE PRODUCTS WERE NOT ACQUIRED FOR THE PURPOSE OF RE-SUPPLY OR FOR THE PURPOSE OF USING THEM UP OR TRANSFORMING THEM IN THE COURSE OF PRODUCTION OR MANUFACTURE OR IN THE COURSE OF REPAIRING OTHER GOODS OR FIXTURES, THEN THIS SECTION C APPLIES.

THE FOLLOWING MANDATORY TEXT IS INCLUDED PURSUANT TO THE AUSTRALIAN CONSUMER LAW AND INCLUDES REFERENCES TO RIGHTS THE USER MAY HAVE AGAINST THE DIRECT SUPPLIER OF THE PRODUCTS: OUR GOODS COME WITH GUARANTEES THAT CANNOT BE EXCLUDED UNDER THE AUSTRALIAN CONSUMER LAW. YOU ARE ENTITLED TO A REPLACEMENT OR REFUND FOR A MAJOR FAILURE AND COMPENSATION FOR ANY OTHER REASONABLY FORESEEABLE LOSS OR DAMAGE. YOU ARE ALSO ENTITLED TO HAVE THE GOODS REPAIRED OR REPLACED IF THE GOODS FAIL TO BE OF ACCEPTABLE QUALITY AND THE FAILURE DOES NOT AMOUNT TO A MAJOR FAILURE. THE INCLUSION OF THIS TEXT DOES NOT CONSTITUTE ANY REPRESENTATION OR ACCEPTANCE BY CATERPILLAR OF LIABILITY TO THE USER OR ANY OTHER PERSON IN ADDITION TO THAT WHICH CATERPILLAR MAY HAVE UNDER THE AUSTRALIAN CONSUMER LAW.

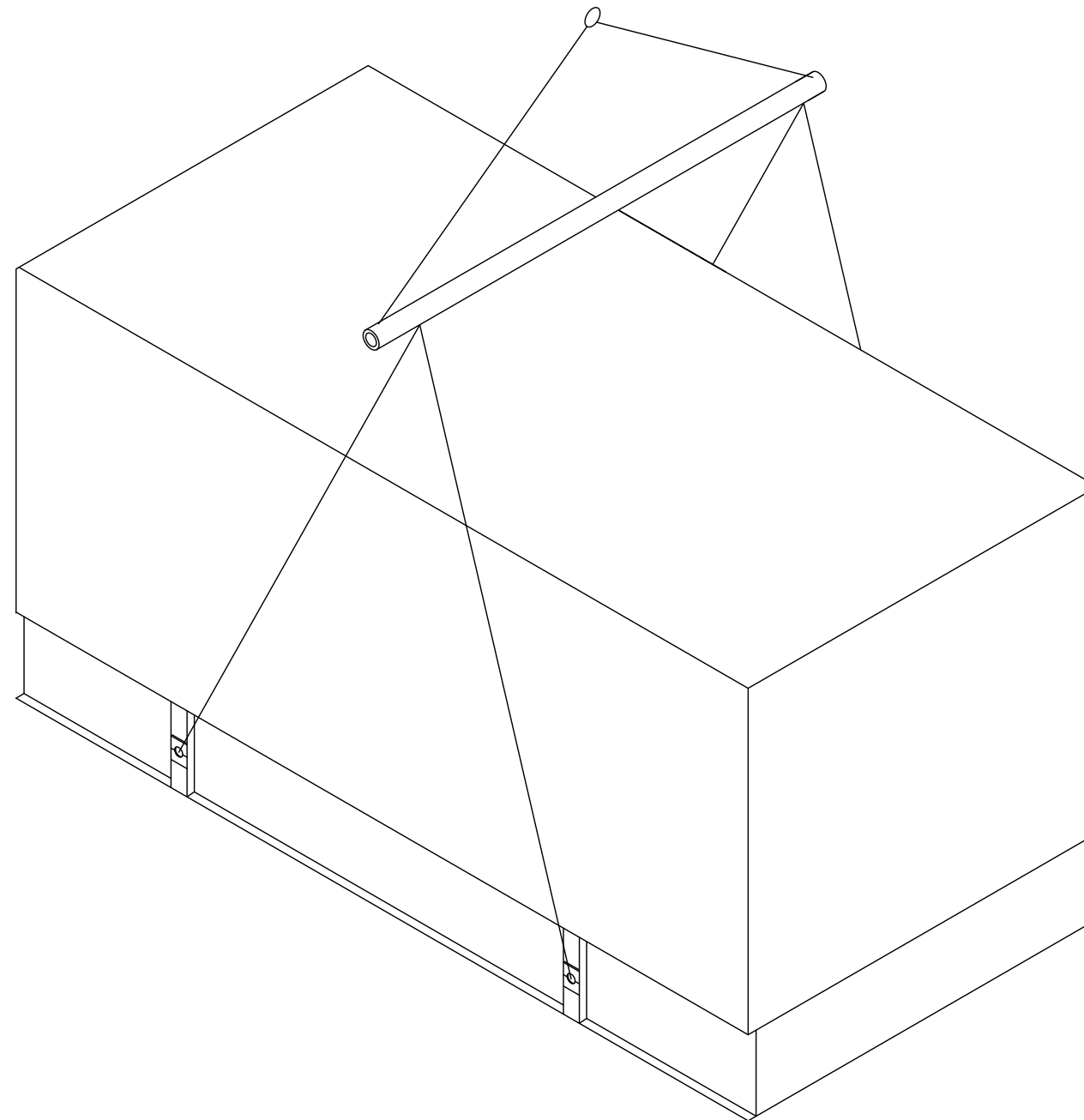
TO THE EXTENT THE PRODUCTS FALL WITHIN THIS SECTION C BUT ARE NOT OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION, CATERPILLAR LIMITS ITS LIABILITY TO THE EXTENT IT IS PERMITTED TO DO SO UNDER THE AUSTRALIAN CONSUMER LAW TO, AT ITS OPTION, THE REPAIR OR REPLACEMENT OF THE PRODUCTS, THE SUPPLY OF EQUIVALENT PRODUCTS, OR THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT PRODUCTS.

THE WARRANTY SET OUT IN THIS DOCUMENT IS GIVEN BY CATERPILLAR INC. OR ANY OF ITS SUBSIDIARIES, 100 N. E. ADAMS ST, PEORIA, IL USA 61629, TELEPHONE 1 309 675 1000, THE USER IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH MAKING A CLAIM UNDER THE WARRANTY SET OUT IN THIS DOCUMENT, EXCEPT AS EXPRESSLY STATED OTHERWISE IN THIS DOCUMENT, AND THE USER IS REFERRED TO THE BALANCE OF THE DOCUMENT TERMS CONCERNING CLAIM PROCEDURES, CATERPILLAR RESPONSIBILITIES AND USER RESPONSIBILITIES.

TO THE EXTENT PERMISSIBLE BY LAW, THE TERMS SET OUT IN THE REMAINDER OF THIS WARRANTY DOCUMENT (INCLUDING SECTION B) CONTINUE TO APPLY TO PRODUCTS TO WHICH THIS SECTION C APPLIES.

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RECOMMENDED OFF-LOADING METHOD

- SPREADER BAR MUST BE WIDER THAN ENCLOSURE
- ALL LIFTING EYES MUST BE USED

Ring Power®			
EQUIPMENT LIFTING DIAGRAM			
DRAWN BY:	JW	REVISION	
DATE:	09/30/10	REVISION	
SCALE:	NONE	DRAWING NO.:	LIFT

ATTACHMENTS



ULCERT UL 2200 LISTING

INCLUDES THE FOLLOWING:

ALTERNATOR

Alternator insulation system is UL Recognized (UL 1446). PMG and AREP alternators are available. Automatic voltage regulators are UL Recognized.

WIRE HARNESS

AC, DC, and power harnesses are made with UL Listed wire and UL Listed terminals.

CONTROL PANEL

Control panels are comprised of UL Listed and UL Recognized components. EMCP is UL Recognized.

CIRCUIT BREAKER

Output circuit breaker is 100% rated and UL Listed.

TESTING

All UL Listed sets are designed and rigorously tested in accordance with UL Standard for Safety, UL 2200.

LABELING

Labeling meets UL requirements.

MECHANICAL OPTIONS

Mechanical options do not require UL Listing and, therefore, are not affected. The exceptions to this are:

FUEL TANKS

If a fuel tank is ordered with the unit, it must be UL Listed. Two versions are available: 24 hour integral (FCUL2) and 24/48 hour sub-base (FSBT)

ENCLOSURES

Factory installed enclosures meet UL requirements. Weatherproof and sound attenuated versions are available.

ELECTRICAL OPTIONS

The table below shows electrical options that meet UL requirements:

EBH	Battery Heater
EOS	Lube Oil Sump Heater
WCA1	Low Coolant Level Shutdown
WSS1	Low Coolant Temperature Alarm
AH1H	Anti-Condensation Heater
WHH	Coolant Heater
GOVE5	Electronic Governor (Fully Adjustable)
FSS1	Critical Low Fuel Level Shutdown
FSS2	Low Fuel Level Alarm
FSS5	Critical High Fuel Alarm
PBC5UL	UL Listed Battery Charger
PBC10NU	NFPA Battery Charger, UL Listed

UL Listing is available on all diesel fuelled generator sets up to 175 kW at 60 Hz, 600 vac maximum.

Materials and specifications are subject to change without notice.

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ENGINE DIVISION

ENGINE DATA SHEET

SUBJECT: GENERATOR SET PROTOTYPE TESTING

This document serves to certify the prototype testing that Caterpillar performs on its generator sets. The Caterpillar reputation for quality is well founded -- that's by design. Tens of thousands of Caterpillar Generator Sets are in use worldwide. Quality design, manufacture, and testing of performance-matched components makes them dependable power sources.

Caterpillar does extensive testing of its generator sets to ensure quality and long-lasting reliability for power requirements throughout the world. Prototype testing is an integral part of generator set evaluation and is performed on the engine; generator; and finally, the entire generator set. Prototype test data is used as the basis for performance guidelines for production generator sets, as well as the basis for the information in the Technical Information File (TIF) published by Caterpillar. Prototype testing will be outlined in three sections: Engine Prototype Testing, Generator Prototype Testing, and Generator Set Prototype Testing.

Engine Prototype Testing

Caterpillar's commitment to a reliable quality product starts with the design and development of engine systems in the Caterpillar Technical Center at Mossville, Illinois, U.S.A. The most modern instrumentation and lab testing procedures are employed to evaluate engine and component performance. Instrument labs throughout the Technical Center are used to determine the performance of new engine designs and modifications. New and modified engine designs are tested for performance and durability in thousands of hours of simulated operation in Caterpillar research test cells. The major test work performed on an engine under development in the prototype stages includes but is not limited to:

- Engine Performance
 - Partial Loads
 - Full Load
 - Lug
- Oil Consumption
- Fuel Consumption
- Exhaust Emissions
- Noise Levels
- Statability -- Cold Weather and Hot Weather
- Piston, Ring, and Liner Wear for Life Projections
- Piston Structure Test
- Lube System Evaluation
- Cooling System Performance and Heat Rejection
- Valve Train Overspeed Qualification
- Deep Thermal Cycle Endurance
- Cycle Endurance in the Lab
- Field Endurance

There are many more tests which include engine component testing such as:

- Governors
- Injectors
- Bearings
- Turbos
- Valves
- Lifters
- Water Pumps
- Oil Pumps
- Fuel Lines

Engine prototype testing is an integral part of the development of all Caterpillar Engines and is performed before any power generation test is attempted. This test is to assist in quality control of the final product and provide a record of the test results for future reference. Whenever the output requirement of the generator set engine is increased beyond that of the original basic dynamometer test, or when major components are changed, Caterpillar Generator Set Engines are submitted for test to verify performance to Caterpillar standards.

Generator Prototype Testing

Generator concept is designed and approved before any manufacture of test generators. Sufficient design data for analysis includes, but is not limited to, layout drawings, computer design sheets, torsional and linear vibration analysis data requirements, and mechanical assembly details. Caterpillar designs structural and electrical generator characteristics to match specific Caterpillar Engine performance. Generator-design meets or exceeds the quality standards commensurate with the quality expected of machines operating in prime power applications for similar output range. Generators are designed and tested in such a manner to achieve factory works approval by all recognized marine agencies, including the American Bureau of Shipping, Lloyd's Register of Shipping, Bureau Veritas, and Det norske Veritas. Verification of design and assurance of compliance with design quality standards is performed by a test development program performed on prototype generators manufactured to the concept design approved by Caterpillar. For verification of design and assurance of compliance to Caterpillar standards, the performance test work includes but is not limited to the following tests:

- Standard Production Tests
- Temperature Rise Heat Runs at Both 50 and 60 Hz and at Continuous and Standby Ratings
- Motor Starting at 50 and 60 Hz at 1.0 and 0.8 Power Factor
- Wave Form Harmonic Analysis
- Wave Form Pictures
- Saturation Curves
 - No Load
 - Short Circuit
 - Rated Load
- Direct Axis Synchronous Reactance
- Negative Sequence Reactance
- Zero Sequence Reactance
- Direct Axis Transient Reactance
- Voltage Dip and Rise (Application and Rejection)
- Voltage Wave Form Deviation

- Voltage Unbalance
- Part Load Readings
- Motorized for no Load Losses
- Exciter Open and Short Circuit Saturation Curve
- Efficiency/Loss Test
- Verification of Compliance
 - Overload Capability
 - Short Circuit Capability
 - 150% Overspeed Capability
- EMI Test
- Telephone Influencer Factor and Telephone Harmonic Factor

These tests are to be conducted in accordance with MIL Std-705B and additional test procedures approved by Caterpillar. Applicable standards include MG1-22 NEMA, CSA Std. C22.2-100, C50 (A.N.S.I.), IEC Pub. 34-1, BS 4999, and BS 5000.

Generator Set Prototype Testing

Caterpillar performs electrical tests and mechanical tests on prototype generator sets to assure that the engine-generator combination will perform adequately and reliably. Electric AC power generator tests incorporate a group of 15 tests in the procedure to evaluate the engine-generator combination. Although the entire series of tests may not be required in each situation, the proper selection of tests will provide an adequate evaluation. The following 15 tests provide a comprehensive evaluation of Caterpillar AC power generator sets.

- Waveform Analysis
- Voltage Adjustment
- Voltage Frequency Curve
- Voltage Drift
- Voltage Spike Check
- Voltage Sensing Loss
- Diode Stress
- Short Circuit Tests
- Harmonic Analysis
- Heat Runs
- Motor Starting
- Transient Response
- Excitation Requirements
- Saturation Curves
- Voltage Overshoot During Start

In addition to the rigorous electrical tests performed on Caterpillar Generator Sets, complete system testing and evaluation is performed on prototype generator sets. Prototype generator sets are subjected to extensive testing and endurance runs, including teardown after testing and complete inspection for stress or worn parts for signs of fatigue. Prototype generator sets must pass this stringent testing before production models are released for sale. Complete system testing for generator sets includes but is not limited to:

- Mounting Evaluation
- Wiring Compatibility
- Control Panel Functions
- Linear Vibration

- Torsional Analysis
- Radiator and Cooling Performance
- Fuel Consumption
- Oil Consumption
- Noise Levels
- Governor Response
- Heat Rejection Data
- Full Load Performance Checks
- Safety Shutdowns
 - High Water Temperature
 - Overspeed
 - Low Oil Pressure
 - Overcranking
- Auto Start and Shutdown Capabilities

In conclusion, Caterpillars generator sets undergo extensive prototype testing procedures. However, the Caterpillar commitment to quality does not stop at prototype testing. Production testing is just as important, if not more important, than Caterpillar's extensive prototype testing. Caterpillar sets the industry standard for production generator set testing. All engines are 100% dynamometer tested, all generators are fully loaded with motor drive, and all generator sets are assembled and tested again at partial and full loads with full electrical and mechanical tests to ensure the customer receives a quality product.

5

TRANSFER SWITCH



City of Ocoee Water Plant

SWITCH SUBMITTAL

REVISION 00

Alfredo Engay

Sales Representative

Alfredo.EngayJr@ascopower.com

Tel # 9739662040

City of Ocoee Water Plant

Reference Quote: XT-518205-01

Sales Order: N/A

TRANSFER SWITCH DETAILS									
ATS NAME	QTY	AMPS / POLES (VOLTS)	BYPASS	TRANSITION TYPE	CATALOG NUMBER	ACCESSORIES	OUTLINE DRAWING	WIRING DIAGRAM	BOM NUMBER
	1	2000 / 4 (480V)	N/A	DELAYED	G3ADTSB32000NGXC	11BE	1001395	1001665	1080992

Transfer Switch Withstand and Closing Ratings																					
				300, 4000 & 7000 Series							300, 4000 & 7000 Series				7000 Series						
ATS NAME	FRAME SIZE	SWITCH RATING AMPS		CURRENT LIMITING FUSES				SPECIFIC BREAKER			TIME BASED				Short Time Ratings ³ (sec)						
															480V Max.				600V Max.		
		Transfer Switches	Bypass Switches	480V Max.	600V Max.	MAX SIZE, A	CLASS	240V Max.	480V Max.	600V Max.	Time(Sec)	240V Max.	480V Max.	600V Max.	.13	.2	.3	.5	.1	.13	.3
-	G ⁸	1600 - 2000	1600 - 2000	200kA	200kA	3000	L	125kA ⁶	125kA ⁶	100kA	0.05	200kA	200kA	100kA	42kA	36kA	42kA	-	-	-	-

NOTES:

- 1) All WCR values indicated are tested in accordance with the requirements of UL 1008, 7th Edition.
- 2) Application requirements may permit higher WCR for certain switch sizes.
- 3) Short Time ratings are provided for applications involving circuit breakers that utilize trip delay settings for system selective coordination
- 6) Rating shown is for Bypass switches only, Transfer Switch rating is 100kA
- 8) These frames are only available on the 7000 Series product

City of Ocoee Water Plant

Transfer Switch Details

#1	ATS	AMPS: 2000	QTY: 1
Product	: Series 300	Catalog Number	: G3ADTSB32000NGXC
Service Voltage / Hz	: 480V/60Hz	Optional Accessories	: 11BE
Bypass Isolation	: Not Applicable	Product Description	: 300 Series, Automatic Delayed Transition Transfer Switch
No. of Switched Poles	: 4	Neutral Configuration	: Switched [B]
Withstand Rating:	: See WCR Table Below	No. of Cables & Lug Size	: 6, 1/0 AWG to 600 MCM
Frame = G, Switch Rating = 2000, Series = 300			
Enclosure	: 1(C)-UL Type 1 Enclosure	Service	: Three Phase, 4-wire
Extended Warranty	: Not Included	Markings	:

#	ACCESSORY DESCRIPTIONS	
	Accessory Code	Description
1	11BE	Adds the following features to the Group G controller: (1) Serial RS-485 Modbus Communications (2) Multi-Schedule Engine Exerciser (3) a 300 Entry Event Log and (4) a common alarm output function. When applied on 3-phase systems it also enables: (1) 3-Phase Emergency Source VLL sensing (2) Phase Rotation Monitoring (3) Emergency Source VLL Unbalance Monitoring.

8 7 6 5 4 3 2 1

OUTLINE FOR ASCO® 300 SERIES 1000-2000 AMPERE "G" FRAME (G3ATS,G3NTS,G3ADTS,G3NDTS) FRONT CONNECTED TRANSFER SWITCHES TYPE 1 ENCLOSURE

D

C

B

A

TOP VIEW
CONDUIT AREA
7.25" x 18.00"
[184mm x 457mm]

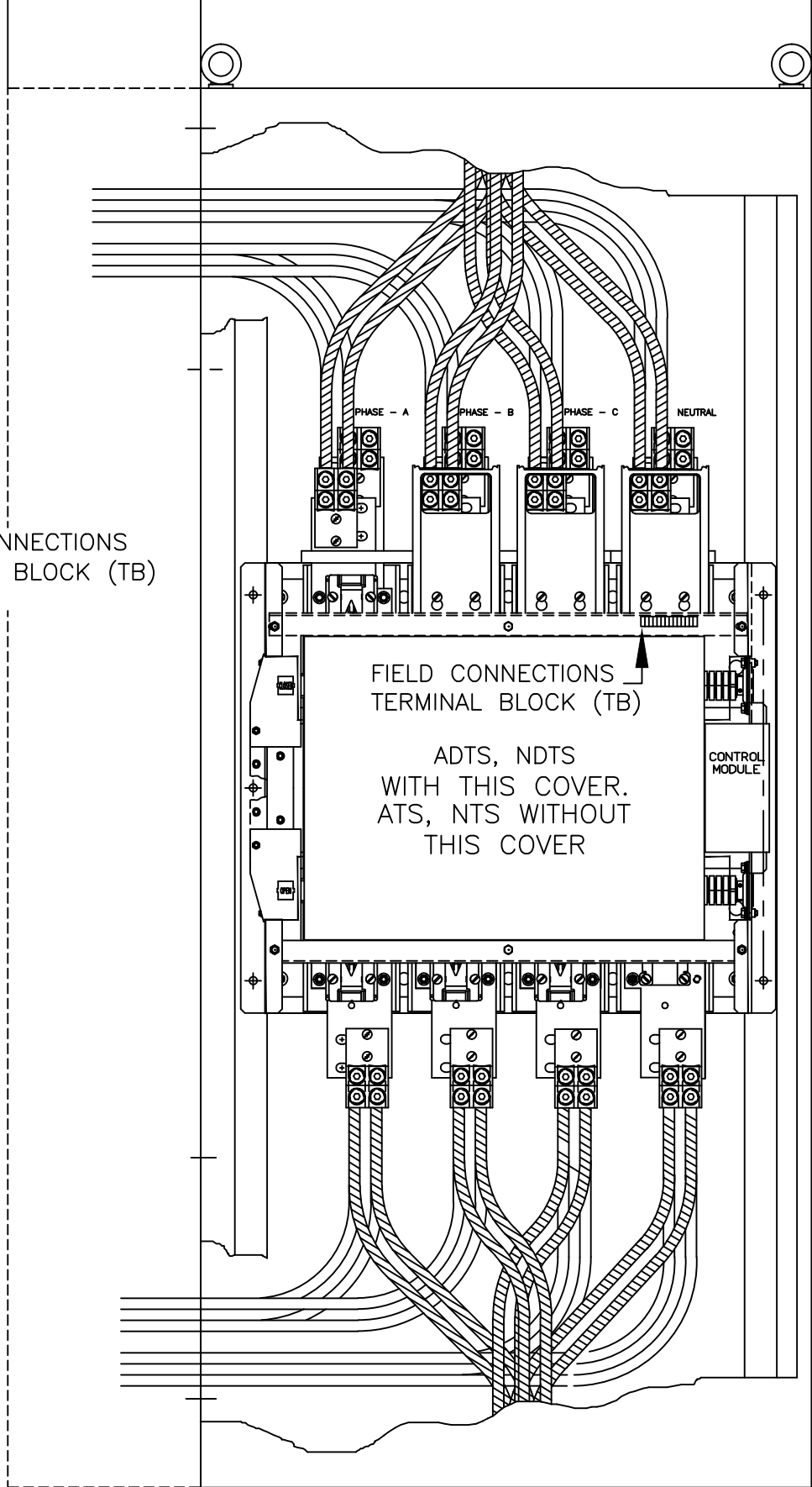
TOP VIEW
CONDUIT AREA
32.00" x 18.00"
[813mm x 813mm]

"TOP VIEW"



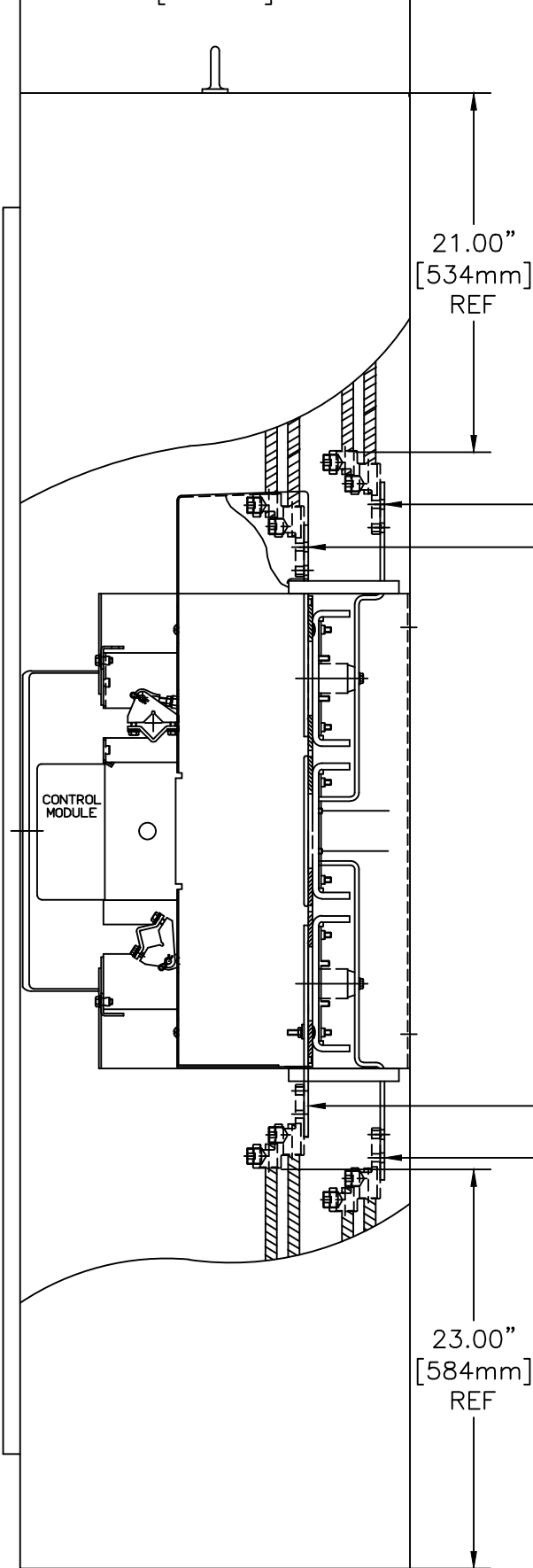
VENTS REQUIRED FOR 2000 AMP TRANSFER SWITCH.
SEE GENERAL NOTE 11.

23.00" [584mm]
12.00" [305mm]
38.00" [965mm]
12.00" [305mm]
38.00" [965mm]



"FRONT VIEW"
WITH DOOR REMOVED

23.00" [584mm]



"RIGHT SIDE VIEW"

LOAD PHASE &
NEUTRAL TERMINATIONS.
STANDARD EMERGENCY PHASE &
NEUTRAL TERMINATIONS OUT
THE TOP.

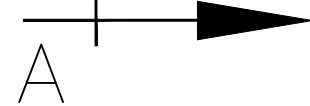
STANDARD NORMAL PHASE &
NEUTRAL TERMINATIONS OUT THE
BOTTOM.
"OPTIONAL" LOAD PHASE &
NEUTRAL TERMINATIONS.

21.00" [534mm]
REF

23.00" [584mm]
REF

PULL BOX
OPTIONAL

"FRONT VIEW"



ACCESS COVERS
FOR OPTIONAL
CABLE PULL BOX

CONDUIT AREA
15.00" x 15.00"
[381mm x 381mm]

"LEFT SIDE VIEW"

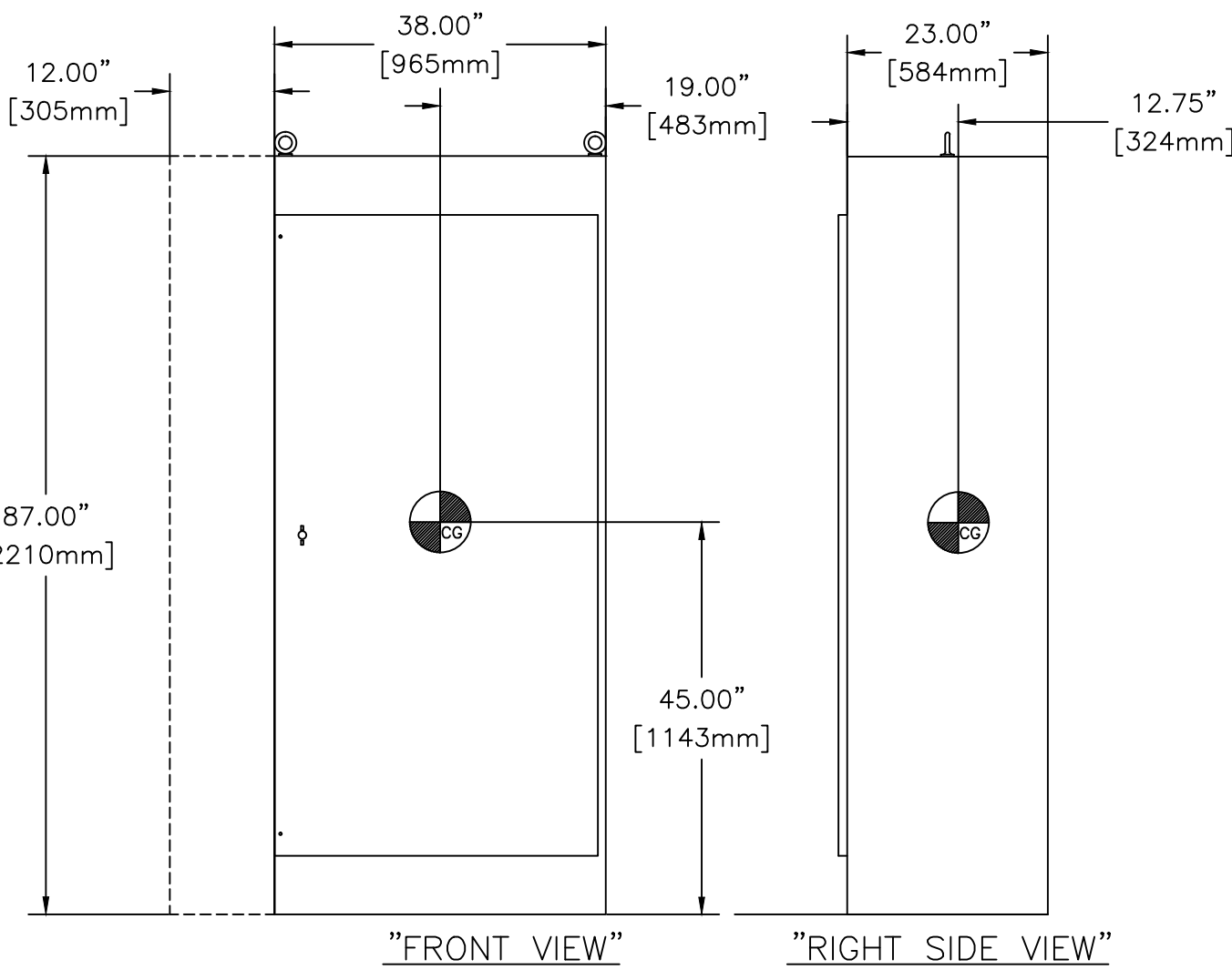
"SECTION A-A"

Ø0.56
[Ø14mm]
MTG HOLES
(OPTIONAL)
PULL-BOX
(2 PLACES)

BOTTOM VIEW
CONDUIT AREA
7.25" x 18.00"
[184mm x 457mm]

BOTTOM VIEW
CONDUIT AREA
32.00" x 18.00"
[813mm x 813mm]

"BOTTOM VIEW"



"FRONT VIEW"

"RIGHT SIDE VIEW"

GENERAL NOTES

- TYPE 1 ENCLOSURE. FREE STANDING. FLOOR MOUNTED. CODE GAUGE FORMED FRAME CONSTRUCTION.
- NEC STANDARD GAUGE PAN TYPE DOOR WITH LOCKABLE HANDLE.
- FINISH: ANSI 61 GRAY, POLYESTER POWDER STANDARD. OTHER ANSI COLORS AVAILABLE CONSULT FACTORY. UL RECOGNIZED.
- CONSTRUCTION IS IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF UL 1008.
- RECOMMENDED CLEARANCES:
FRONT: 36.00" [914mm].
- A 20% RATED GROUND BUS IS PROVIDED.
- UNIT IS DESIGNED FOR COMBINATION TOP AND BOTTOM CABLE ENTRY. THE STANDARD SWITCH CONFIGURATION IS FOR TOP ENTRY EMERGENCY & LOAD AND BOTTOM ENTRY NORMAL. OPTIONALLY, THE SWITCH MAY BE SUPPLIED WITH BOTTOM ENTRY LOAD. (REFER TO THE WIRING DIAGRAM FURNISHED WITH EACH TRANSFER SWITCH TO DETERMINE TERMINATION POSITIONS).

IMPORTANT NOTE:

UNDER NO CIRCUMSTANCES SHOULD POWER CABLES BE ROUTED ALONG THE SIDES OF THE TRANSFER SWITCH. AN OPTIONAL CABLE PULL BOX WHICH MOUNTS ON THE LEFT SIDE OF THE ENCLOSURE IS AVAILABLE WHEN CONDITIONS EXIST FOR WHICH CABLES MUST RUN BETWEEN THE TOP AND BOTTOM OF THE UNIT. GROUND CONDUCTORS ONLY MAY BE RUN ALONG THE LEFT SIDEWALL OF THE ENCLOSURE.

- NEUTRAL CONFIGURATIONS:
AN OPTIONAL FULL RATED NEUTRAL CONFIGURATION FOR EACH SOURCE AND THE LOAD MAY BE PROVIDED. WHEN EQUIPPED IT IS IN ONE OF THE FOLLOWING FORMATS AS SPECIFIED BY THE CATALOG NUMBER NO. NEUTRAL TYPE:
(A) SOLID (COPPER BUS) NEUTRAL.
(B) SWITCHED NEUTRAL POLE.

- CENTER OF GRAVITY.

- NO KNOCKOUTS ARE PROVIDED.
- 2000 AMP TRANSFER SWITCH ONLY.
- (OPTIONAL) LEFT SIDE PULL BOX AVAILABLE FOR TOP AND BOTTOM CABLE ACCESS WHEN REQUIRED. CONTACT FACTORY FOR DETAILS AND SHIPPED SEPARATELY.
A. TO ATTACH PULL BOX TO THE LEFT SIDE OF THE ENCLOSURE. REMOVE CONDUIT SIDE COVERS FROM ENCLOSURE. MOVE PULL-BOX INTO POSITION. USE HARDWARE FROM CONDUIT SIDE COVERS TO ATTACH THE PULL-BOX TO ENCLOSURE.

CABLING NOTES

- ALL SIZES SUPPLIED STANDARD WITH MECHANICAL (SCREW TYPE) LUGS. (SEE AMP SIZE BELOW)
A. LUG MATERIAL: ALUMINUM ALLOY 6061-T6 WITH ELECTRO TIN PLATED FINISH.
B. SCREW MATERIAL: ALUMINUM ALLOY 6262-T9 WITH ELECTRO TIN PLATED FINISH.
C. UL LISTED, CSA CERTIFIED.
D. LUG SCREW TIGHTENING TORQUE PER UL 486B: 19 FT-LBS.
E. SUITABLE WIRE BENDING SPACE IS PROVIDED. (SEE AMP SIZE BELOW)

- GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS. (SEE AMP SIZE BELOW)

NOTES 1000-1200 AMPS

- SUPPLIED WITH STANDARD MECHANICAL (SCREW TYPE) LUGS ON THE NORMAL, EMERGENCY & LOAD BUS STABS. ONE (1) LUG PER PHASE AND NEUTRAL EACH SUITABLE FOR CONNECTION OF FOUR (4) 1/0 - 750MCM CU/AL CABLE (SEE NOTE "E" BELOW).
E. SUITABLE WIRE BENDING SPACE IS PROVIDED FOR UP TO FOUR (4) 600MCM CABLES PER TERMINAL PER NEC.
- GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS;
(12) 1/0 - 750MCM CU/AL CABLE

NOTES 1600-2000 AMPS

- SUPPLIED WITH STANDARD MECHANICAL (SCREW TYPE) LUGS ON THE NORMAL, EMERGENCY & LOAD BUS STABS. ONE (1) LUG PER PHASE AND NEUTRAL EACH SUITABLE FOR CONNECTION OF SIX (6) 1/0 - 750MCM CU/AL CABLE (SEE NOTE "E" BELOW).
E. SUITABLE WIRE BENDING SPACE IS PROVIDED FOR UP TO SIX (6) 750MCM CABLES PER TERMINAL PER NEC.
- GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS;
(12) 1/0 - 750MCM CU/AL CABLE

G3ADTSB32000NGXC,11BE

PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
OUTLINE						
300 SERIES						
1000-2000 AMP (F/C ONLY)						
DRAWN BY	BWM	DATE	10/25/13	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005		ASSEM. REF. NO.
CHECKED	SDH	DATE	10/25/13	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE
PROJECT APPROVAL						SIZE DS
FINAL APPROVAL	SDH	DATE	10/25/13			DWG. NO.
						1001395
						DRAWING B
						ECN NO. 289440
						SHEET 1 OF 1

87654321

THREE PHASE WIRING FOR ASCO® 300 SERIES DELAYED TRANSITION TRANSFER SWITCHES TYPES G3ADTS & G3NDTS RATED 1000-3200 AMPERES

FEATURES, SETTINGS, OPERATION, ACCESSORIES & NOTES

THIS WIRING APPLIES TO 300 SERIES TRANSFER SWITCHES THAT UTILIZE THE "G" FRAME POWER TRANSFER SWITCH RATED 1000–3200 AMPERES.

THE GROUP G CONTROLLER PROVIDES EITHER AUTOMATIC (H3ADTS) OR NON–AUTOMATIC [MANUAL] (G3NDTS) OPERATION BASED ON ITS FACTORY SETTING ACCORDING TO THE CUSTOMER ORDER REQUIREMENTS.

THE TYPE OF TRANSFER SWITCH PROVIDED CAN BE DETERMINED FROM THE PRODUCT IDENTIFICATION MARKINGS LOCATED ON BOTH THE POWER TRANSFER SWITCH AND THE COVER OF THE GROUP G CONTROLLER.

ALL OPERATIONAL SETTINGS AND SEQUENCES OF THE GROUP G CONTROLLER AND ITS RELATED OPTIONAL ACCESSORIES (1UP, 18RX, 23G) ARE PROVIDED IN THE USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400.

INFORMATION FOR INSTALLATION AND TESTING OF THE TRANSFER SWITCH IS PROVIDED IN THE INSTALLATION MANUAL, ASCO 3ADTS & 3NDTS, G–DESIGN 1000–3200 A TRANSFER SWITCHES, PART NUMBER 381333–406.

ENGINE CONTROL CONTACTS

FEATURE 7 & FEATURE 8:
ONE SET OF FORM C CONTACTS "NR" (FEAT. 7 N/C, FEAT. 8 N/O) THAT CHANGE POSITION ON EXPIRATION OF THE FEATURE 1C, OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES TIME DELAY, AND RESET ON EXPIRATION OF THE FEATURE 2E ENGINE COOLDOWN TIME DELAY.
AN AUXILIARY CONTACT THAT IS CLOSED WHEN THE TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE, IS CONNECTED ACROSS THE N/C CONTACT (FEATURE 7).

AN ADDITIONAL SET OF ENGINE STARTING CONTACTS ARE AVAILABLE ON THE GROUP G CONTROLLER WHEN THE FEATURE SETTING OF THE CONTROLLER OUTPUT CONTACTS "OP1" IS SET TO OPERATE AS "NR2". ADDITIONAL CONTACTS "NR2" ARE ALSO AVAILABLE ON RELAY EXPANSION MODULE, "REX".
OUTPUT CONTACTS "OP2" AND/OR "OP3" PROVIDE THE ENGINE STARTING FUNCTION WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "NR2".

ADDITIONAL OPTIONAL ENGINE STARTING CONTACTS "NR2" ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" AND/OR "OP3" PROVIDE THE ENGINE STARTING FUNCTION WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "NR2".

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

LOAD DISCONNECT FEATURE

THE DELAYED TRANSITION TRANSFER SWITCH PROVIDES FOR A "LOAD DISCONNECT" PERIOD DURING TRANSFER TO EITHER SOURCE. DURING THIS PERIOD BOTH THE NORMAL AND EMERGENCY CONTACTS OF THE TRANSFER SWITCH WILL BE OPEN. THE "LOAD DISCONNECT" TIMER IS ADJUSTABLE FROM 0 TO 5 MINUTES 59 SECONDS AND FACTORY SET TO 3 SECONDS.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

ADDITIONALLY, PRE & POST TRANSFER LOAD DISCONNECT SIGNALING CONTROL IS AVAILABLE.
FEATURE 31: INCLUDES SUB–FEATURES 31F, 31G, 31M, 31N
A SET OF FORM C CONTACTS ARE PROVIDED ON THE GROUP G CONTROLLER AS "OP1". WHEN THE FEATURE SETTING OF "OP1" IS SET TO OPERATE THE CONTACTS AS "FEATURE 31", THE TIME DELAY SETTINGS OF THE SUB–FEATURES ARE AVAILABLE.

"OP1" CAN BE SET TO OPERATE TO PROVIDE THE FOLLOWING FUNCTIONS USING THE TIME DELAY SETTINGS ASSOCIATED WITH EACH SUB–FEATURE:

31F – NORMAL TO EMERGENCY PRE–TRANSFER SIGNAL
31G – EMERGENCY TO NORMAL PRE–TRANSFER SIGNAL
31M – NORMAL TO EMERGENCY POST–TRANSFER SIGNAL
31N – EMERGENCY TO NORMAL POST TRANSFER SIGNAL

THE "OP1" OUTPUT CONTACTS CHANGE POSITION FOLLOWING EACH OF THE ABOVE TIME DELAYS.

ADDITIONAL LOAD DISCONNECT CONTACTS, "FEATURE 31" ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2 AND/OR "OP3" WILL PROVIDE LOAD DISCONNECT FUNCTIONS WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "FEATURE 31".

ALL OUTPUT CONTACTS "OP1", "OP2", "OP3") SET TO OPERATE AS "FEATURE 31", SHARE THE COMMON TIME DELAY SETTINGS OF SUB–FEATURES 31F, 31G, 31M, AND 31N.

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

SOURCE AVAILABILITY SIGNALS

SIGNALS INDICATING THE AVAILABILITY OF THE NORMAL & EMERGENCY SOURCES IS PROVIDED WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "RL5" (EMERGENCY SOURCE AVAILABLE) AND "RL6" (NORMAL SOURCE AVAILABLE) CHANGE POSITION WHEN THE SOURCE IS ACCEPTABLE.

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

COMMON ALARM & NOT IN AUTO SIGNALING FEATURES

A SET OF FORM C CONTACTS IS PROVIDED ON THE GROUP G CONTROLLER AS "OP1". THE FEATURE SETTING OF "OP1" CAN BE SET TO OPERATE THE CONTACTS AS A "NOT IN AUTO" SIGNAL.

WHEN "OP1" IS SET FOR "NOT IN AUTO", THE OUTPUT CONTACTS CHANGE POSITION WHEN THE TRANSFER IS BEING INHIBITED FROM TRANSFERRING TO THE EMERGENCY SOURCE (FEATURE 34B) OR THE TRANSFER SWITCH HAS BEEN SET FOR NON–AUTOMATIC (MANUAL) OPERATION.

WHEN OPTIONAL ACCESSORY 11BE "SOFTWARE BUNDLE" IS PART OF THE TRANSFER SWITCH ASSEMBLY, "OP1" MAY ALTERNATIVELY SET FOR A "COMMON ALARM" SIGNAL. THE OUTPUT CONTACTS CHANGE POSITION WHEN A "COMMON ALARM" IS NOT PRESENT AND RESET WHEN A "COMMON ALARM" CONDITION IS PRESENT. THE "COMMON ALARM" SIGNAL CONDITIONS ARE SELECTABLE.

ADDITIONAL "COMMON ALARM" AND "NOT IN AUTO" CONTACTS ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2 AND/OR "OP3" WILL PROVIDE SIGNAL FUNCTIONS WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "COMMON ALARM" OR "NOT IN AUTO".

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

EXTERNAL POWER SUPPLY COMPATIBILITY

USE OF AN EXTERNAL POWER SUPPLY IS USEFUL WHEN REQUIRED TO EXTEND THE FOLLOWING CONTROLLER TIME DELAYS BEYOND 6 SECONDS;

FEATURE 1C – OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES
FEATURE 1F – OVERRIDE MOMENTARY EMERGENCY SOURCE OUTAGES

AN EXTERNAL POWER SUPPLY IS ALSO USEFUL WHEN THE TRANSFER SWITCH IS USED WITH COMMUNICATIONS FEATURES BY ENABLING THE CONTROLLER TO CONTINUE COMMUNICATING.

AN EXTERNAL POWER SOURCE MAY BE PROVIDED TO THE CONTROLLER, UNTIL THE NORMAL SOURCE OR EMERGENCY SOURCE IS AVAILABLE, BY USE OF;

– AN EXTERNAL 24 VDC POWER SUPPLY WITH ACCESSORY 18RX (RELAY EXPANSION MODULE)
OR
– OPTIONAL ACCESSORY 1UP (UNINTERRUPTIBLE POWER SUPPLY MODULE)

EXTERNAL 24 VDC POWER SUPPLY "1G":
AN EXTERNAL 24 VDC POWER SUPPLY MAY BE USED TO POWER THE CONTROLLER WHEN ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" WILL PROVIDE EXTERNAL 24 VDC POWER SUPPLY FUNCTIONALITY WHEN ITS FEATURE SETTING IS SET TO OPERATE AS "1G". ADDITIONALLY, JUMPERS MUST BE RECONFIGURED ON ACCESSORY 18RX (RELAY EXPANSION MODULE) TO ENABLE THIS FUNCTION AS FOLLOWS;

REMOVE JUMPERS "J1" 1–2 & "J1" 3–4
CONNECT JUMPERS "J1" 5–7 & "J1" 6–8

THE OUTPUT CONTACTS CHANGE POSITION WHEN EITHER THE NORMAL SOURCE OR EMERGENCY SOURCE IS AVAILABLE AND RESET WHEN NEITHER SOURCE IS AVAILABLE. THE "OP2" N/C CONTACT SWITCHES CUSTOMER PROVIDED +24 VDC FROM THE EXTERNAL POWER SUPPLY TO THE CONTROLLER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

ACCESSORY 1UP (UNINTERRUPTIBLE POWER SUPPLY):
WHEN OPTIONAL ACCESSORY 1UP IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY, THE CONTROLLER IS PROVIDED WITH LIMITED RESERVE POWER (APPROXIMATELY 3 MINUTES).

LOAD CURRENT METERING

WHEN OPTIONAL ACCESSORY 23GB IS PART OF THE TRANSFER SWITCH ASSEMBLY, THREE PHASE CURRENT MEASUREMENTS ARE AVAILABLE FOR DISPLAY ON THE GROUP G CONTROLLER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR INFORMATION ON USE.

ADVANCED-FUNCTION SOFTWARE BUNDLE

WHEN OPTIONAL ACCESSORY 11BE IS PART OF THE TRANSFER SWITCH ASSEMBLY, AN ADVANCED–FUNCTION SOFTWARE BUNDLE IS AVAILABLE TO PERFORM THE FOLLOWING FUNCTIONS;

– SERIAL COMMUNICATIONS (RS–485)
– PROGRAMMABLE ENGINE EXERCISER
– EVENT LOG
– COMMON ALARM SIGNAL CAPABILITY ON GROUP G CONTROLLER "OP1" OUTPUT.(3 PHASE SENSING ONLY)
– 3 PHASE EMERGENCY SOURCE SENSING.
– PHASE ROTATION SENSING.
– EMERGENCY VOLTAGE UNBALANCE SENSING.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR INFORMATION ON THESE FUNCTIONS.

NON-AUTOMATIC (MANUAL) OPERATION

TRANSFER SWITCH ASSEMBLIES FACTORY SET FOR NON–AUTOMATIC OPERATION PROVIDE USER INITIATED, ELECTRICAL OPERATION OF THE TRANSFER SWITCH TO EITHER AVAILABLE SOURCE. THE TRANSFER SWITCH ASSEMBLY IS PHYSICALLY IDENTICAL TO THAT OF THE AUTOMATIC TYPE.

WHEN THE TRANSFER SWITCH IS SET FOR NON–AUTOMATIC OPERATION, A CUSTOMER PROVIDED SELECTOR SWITCH MAY BE USED TO OPERATE IT FROM A REMOTE LOCATION.

REMOTE CONTROL FEATURES

THE FOLLOWING CONTROL PANEL INPUTS PROVIDE REMOTE CONTROL FUNCTIONS FOR THE TRANSFER SWITCH. EACH FUNCTION CAN BE IMPLEMENTED BY THE CUSTOMER PROVIDING THE FORM OF CONTROL DESCRIBED. EACH CONTROL CONTACT MUST BE SUITABLE FOR A 5 VDC LOW ENERGY CIRCUIT.

EXTERNAL FEATURE 17: REMOTE TRANSFER TO EMERGENCY FEATURE (FOR AUTOMATIC TRANSFER TYPE ONLY) – REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. RE–CLOSURE OF THE CONTACT ACTIVATES THE FEATURE 3A "RETRANSFER TO NORMAL (IF JUST TEST)" TIME DELAY PRIOR TO RETRANSFER. IN THE EVENT THAT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO EMERGENCY AND THE CUSTOMER SUPPLIED CONTACT IS OPEN, THE TRANSFER SWITCH WILL AUTOMATICALLY RETRANSFER TO THE NORMAL SOURCE.

EXTERNAL FEATURE 6B: REMOTE BYPASS OF RETRANSFER TO NORMAL TIME DELAY – REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT BYPASSES FEATURE 3A RETRANSFER TO NORMAL DELAY IF ACTIVE.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

NOTES

1. SWITCH SHOWN DE–ENERGIZED CONNECTED TO NORMAL SOURCE.

2. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUB. ICS 1, PART 1–101A.

3. ALL WIRING IS #16 AWG, TINNED, STRANDED COPPER UNLESS OTHERWISE INDICATED.

4. ○ INDICATES CUSTOMER CONNECTION POINTS.

5. ● INDICATES FACTORY CONNECTION POINTS.

6. CONNECTION POINTS THAT HAVE BOTH CUSTOMER CONNECTIONS AND FACTORY CONNECTIONS ARE SHOWN OPEN AS CUSTOMER CONNECTION POINTS.

7. THE TRANSFER UNIT IS MOUNTED ON THE BACK INSIDE SURFACE OF THE ENCLOSURE. THE CONTROL PANEL AND ANY OPTIONAL ACCESSORIES ARE MOUNTED ON THE INSIDE SURFACE OF THE DOOR.

8. AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.

9. GROUND STRAP ON CONTROL PANEL IS AFFIXED TO CHASSIS (ENCLOSURE) AT LOWER LEFT CONTROL PANEL MOUNTING STUD.

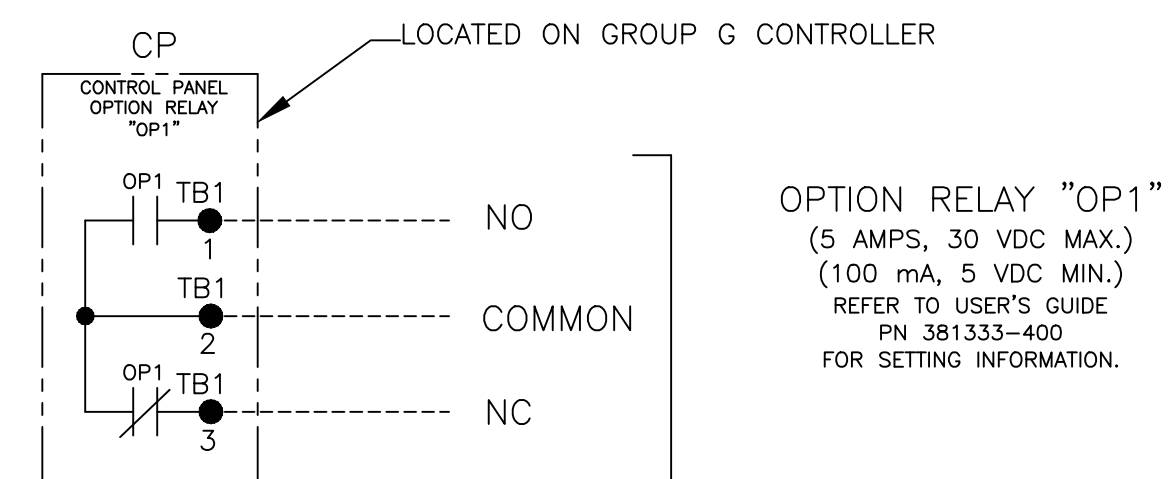
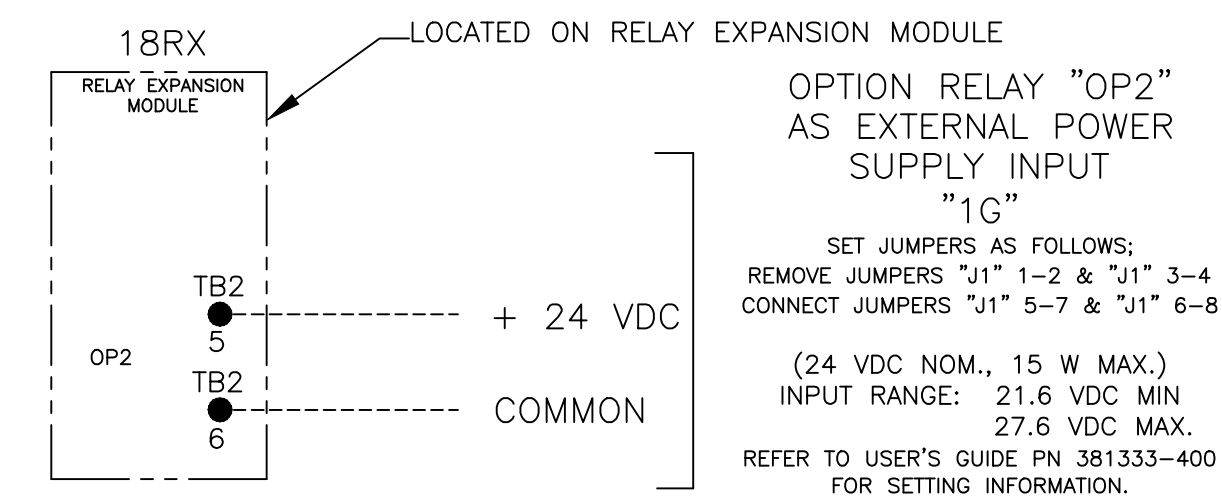
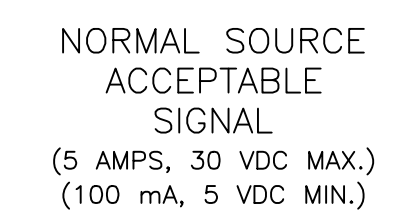
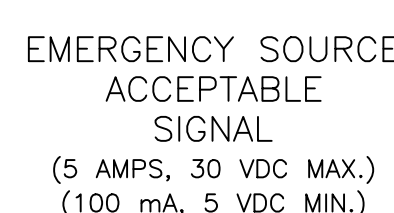
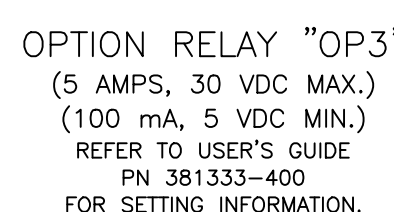
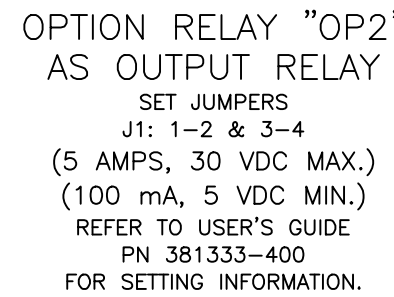
BASE CATALOG NUMBER				CATALOG NUMBER SUFFIXES				EXPLANATION OF CATALOG NUMBER CODES												
TS FRAME	CATALOG TYPE	NEUTRAL TYPE	PHASE POLES	AMPS	VOLT CODE	CONTROLLER	OPTIONAL ACCESSORY	ENCLOSURE CODE	CATALOG TYPE	NEUTRAL TYPE	VOLTAGE CODES (3 OR 4 WIRE) 50, 60, 60 Hz		ENCLOSURE CODES							
									CODE	DESC.	CODE	DESCRIPTION	CODE	NOMINAL VOLTAGE	CODE	TYPE	DESCRIPTION			
									3ADTS	AUTOMATIC	BLANK	NONE	C	208	BLANK	1	OPEN TYPE (NO ENCLOSURE)			
									3NDTS	MANUAL	A	SOLID	D	220	C	2	GENERAL PURPOSE, INDOOR			
											B	SWITCHING	E	230	E	3R	INDOOR, WATER & DUST RESISTANT			
													F	240	F	4	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT			
													H	380	G	4X	INDOOR/OUTDOOR, WATERTIGHT & DUST TIGHT			
													J	400	H	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)			
													K	415	J	4X	TYPE 4 PLUS CORROSION RESISTANCE (FIBERGLASS)			
													L	440	K	7	EXPLOSION PROOF			
													M	460	L	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OIL TIGHT & DUST TIGHT			
													N	480			(SECURE ENCLOSURES)			
													P	550	M	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT			
													Q	575	N	4	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT			
													R	600	P	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)			
															Q	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT			

CATALOG NUMBER _____
CERTIFIED TO
S.O. _____
BY: _____
DATE: _____
FORM REV D [G3ADTSB32000NGXC,11BE]
PROJECT NAME: _____
WIRING _____
300 SERIES (G3ADTS/G3NDTS) 3PH 1000–3200 AMPS
"G" FRAME GROUP G CONTROLS
DRAWN BY TR 1/9/14
CHECKED BK 1/9/14
PROJECT APPROVAL BK 1/9/14
FINAL APPROVAL _____
MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–1–003. FOR PLASTIC PARTS SEE MP–1–005.
PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
SCALE NONE SIZE DS
DWG. NO. 1001665
DRAWING D REV. 10F 7

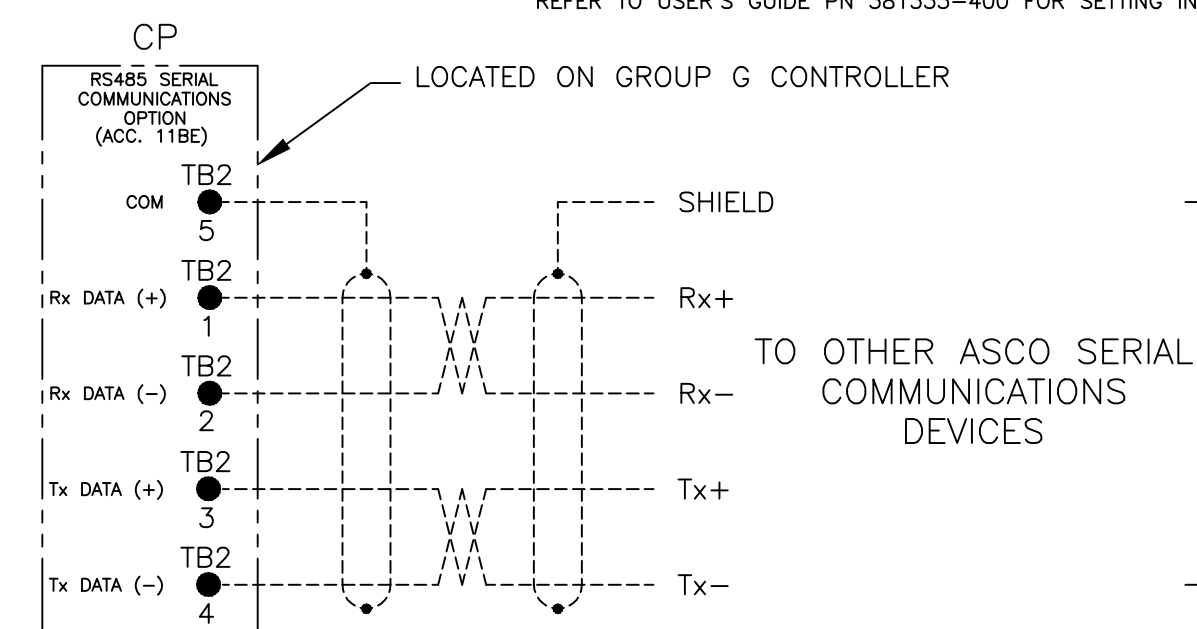
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248503 AE BK 05/21/14
247774 SDH SDH 4/14/14
246325 AE BK 01/16/14
246168 TR BK 1/9/14
ECN NO. BY APP. DATE
COMPUTER GENERATED DRAWING
ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

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Page 284 of 1460



AVAILABLE WITH OPTIONAL ACCESSORY 11BE: ADVANCED-FUNCTION SOFTWARE BUNDLE
REFER TO USER'S GUIDE PN 381333-400 FOR SETTING INFORMATION.



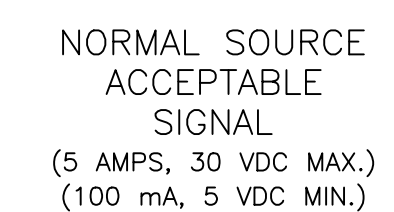
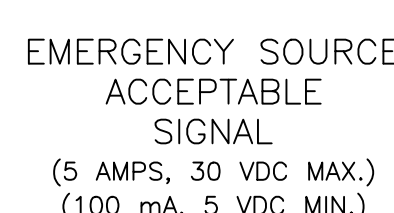
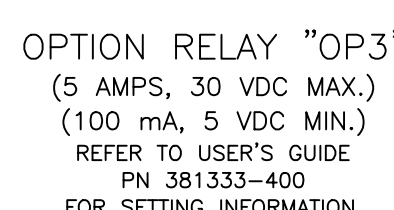
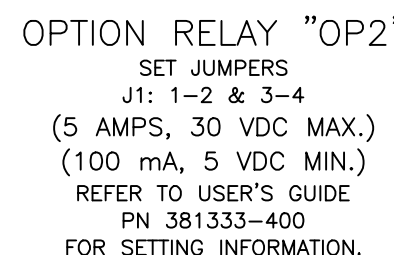
NOTES:

1. EARTH GROUND SHIELD AT HOST DEVICE ONLY.
2. FIELD WIRING: USE UL LISTED, STRANDED, TWISTED PAIRS, OVERALL FOIL SHIELD WITH STRANDED DRAIN WIRE SUITABLE FOR RS422 EQUIVALENT TO:

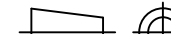
(STANDARD 80°C) BELDEN 9842 OR 9829
OR ALPHA 6202C OR 6222C

(PLENUM RATED) BELDEN 89729 OR 82729
OR ALPHA 58902

B



D	275211	TR	BK	10/15/18
	SEE ECN			
C	248503	AE	BK	05/21/14
	SEE ECN			
B	247774	SDH	SDH	4/14/14
	SEE ECN			
A	246325	AE	BK	01/16/14
	SEE ECN			
—	246168	TR	BK	1/9/14
	ISSUE			

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM		 THIRD ANGLE PROJECTION		
3000 SERIES (G3ADTS/G3NDTS) 3PH 1000-3200 AMPS								
"G" FRAME GROUP G CONTROLS								
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASQO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055				ASSEM. REF. NO.		
DRAWN BY	TR	1/9/14	COMPUTER GENERATED DRAWING					
CHECKED	BK	1/9/14	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			SCALE	NO.	SIZE DS
PROJECT APPROVAL	BK	1/9/14				DWG. NO.		
FINAL APPROVAL			 ASCO POWER TECHNOLOGIES, L.P. FLOHAM PARK, NEW JERSEY 07932 U.S.A.			DRAWING NO. 10001665		
						REV. D	ECN 275211	SHEET 2 OF 7

D

C

B

A

D

C

B

A

MAIN POWER POLES

TS OPERATOR CIRCUIT

EMERGENCY

LOAD

NORMAL

OPTIONAL NEUTRAL TYPES

REFER TO "EXPLANATION OF CATALOG NUMBER CODES" IN CATALOG NUMBER CHART ON SHEET 1.

- NONE
- SWITCHING
- SOLID BUS PLATE

NOTE:
ATS SHOWN CLOSED ON
NORMAL SOURCE.

NORMAL

EMERGENCY

CN (MUS) CONTACTS					
MUS	SOLENOID POSITION				
	NORM	>	AFTER TDC *	<	OPEN
13-14		X			
15-16		X			
17-18	X				
19-20		X			

CE (MUS) CONTACTS					
MUS	SOLENOID POSITION				
	OPEN	>	AFTER TDC *	<	EMER
13-14		X			
15-16		X			
17-18	X				
19-20		X			

* AFTER SOLENOID CORE PASSES THROUGH TOP DEAD CENTER POSITION.

PROJECT NAME:		REV. TO SHEET		ECN NO.	BY	APP.	DATE
WIRING		DIAGRAM					
300 SERIES (G3ADTS/G3NDTS) 3PH 1000-3200 AMPS							
"G" FRAME GROUP G CONTROLS							
DRAWN BY	TR	DATE	1/9/14	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005		ASSEM. REF. NO.	
CHECKED	BK	DATE	1/9/14	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			
PROJECT APPROVAL	BK	DATE	1/9/14	SCALE: NONE SIZE: DS			
FINAL APPROVAL		DATE		DWG. NO. 1001665			
ASCOT		ASCOT POWER TECHNOLOGIES, L.P.		FLORHAM PARK, NEW JERSEY 07932 U.S.A.		SHEET 3 OF 7	

D

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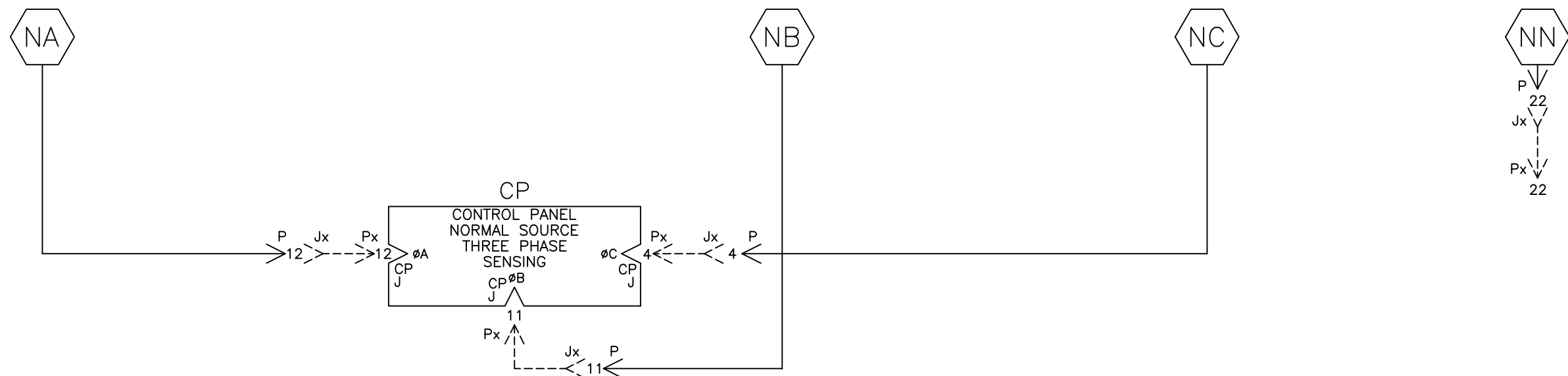
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B

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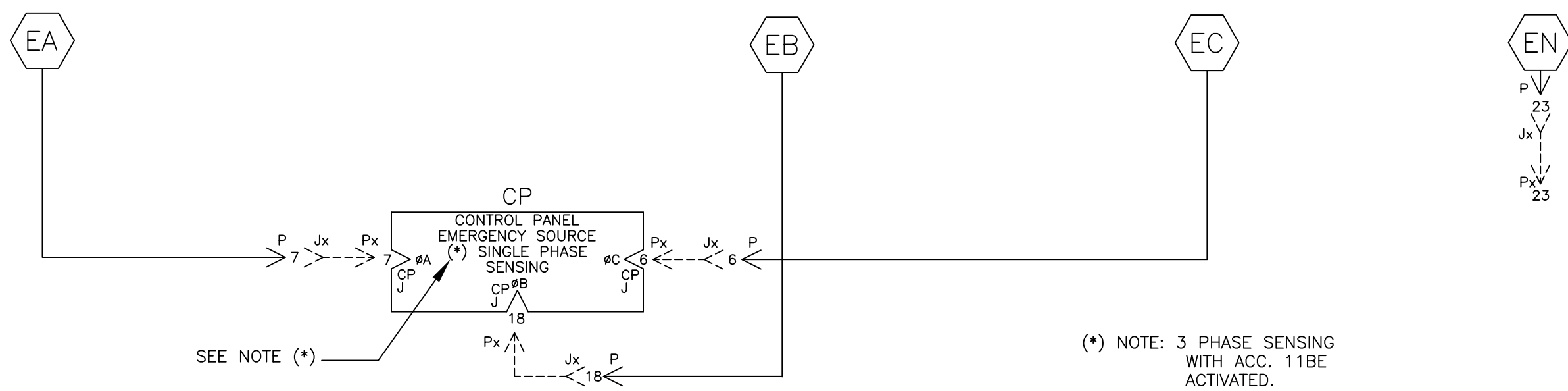
NORMAL SOURCE CIRCUITS

NORMAL



EMERGENCY SOURCE CIRCUITS

EMERGENCY



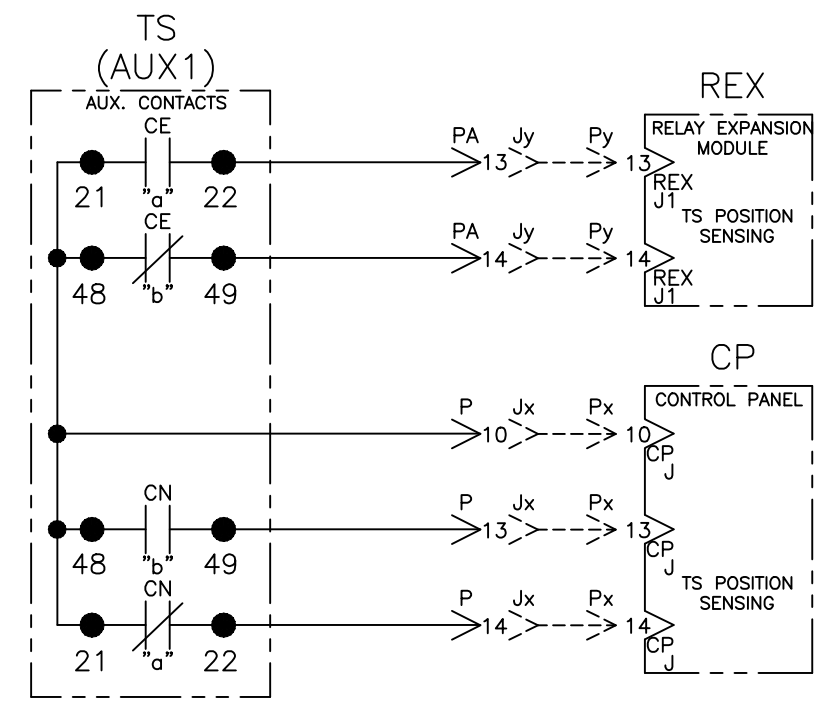
LOAD TERMINAL CIRCUITS

LOAD



CONTROL SIGNALS & INDICATION

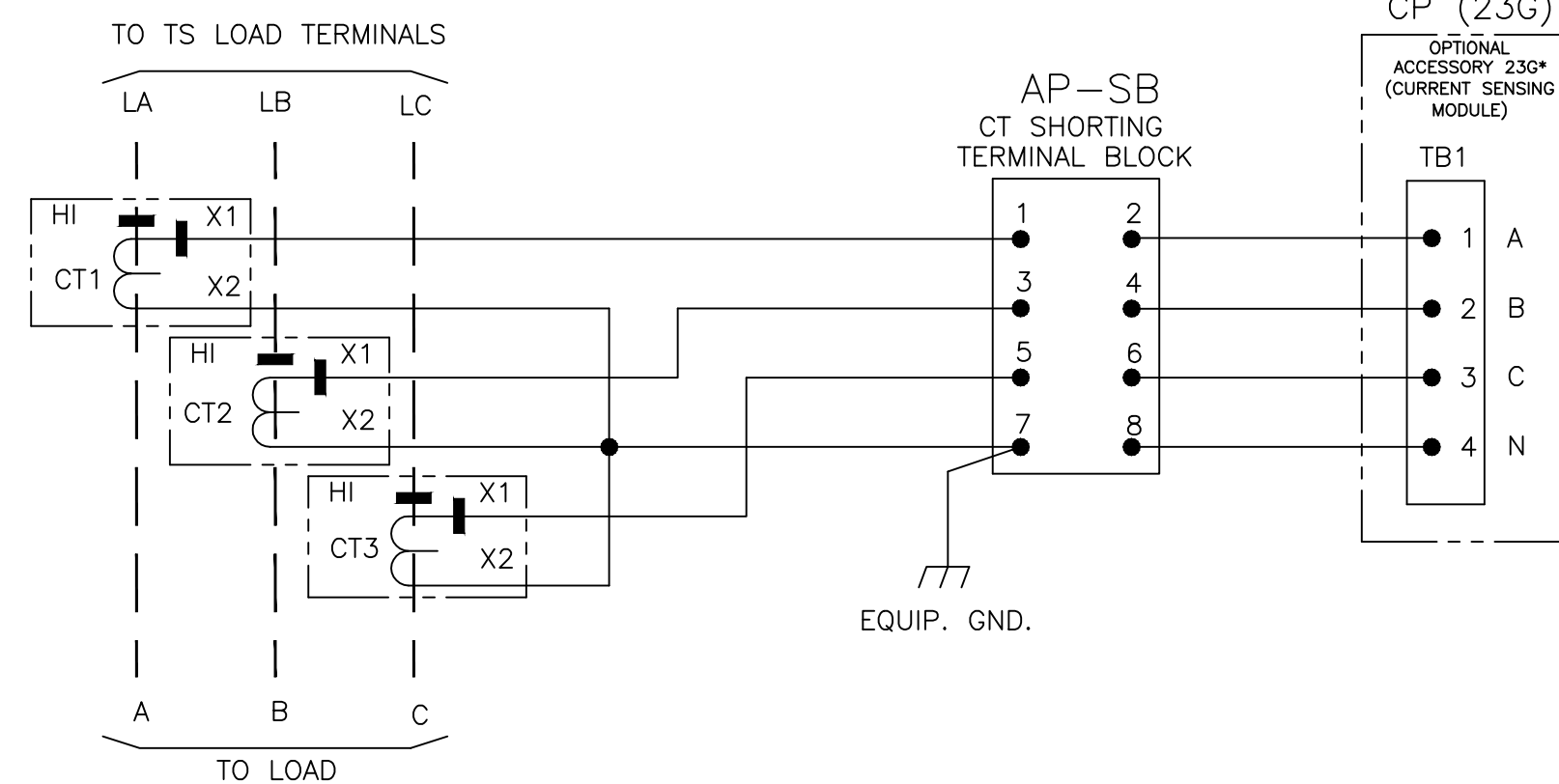
TS POSITION SENSING



ADDITIONAL CIRCUITS

OPTIONAL ACCESSORY 23GB (LOAD CURRENT METERING)

CURRENT TRANSFORMER RATIO TABLE	
SWITCH RATING	CT RATIO
1000A	1200:5A
1200A	
1600A	2000:5A
2000A	
2600A	3000:5A
3000A	
3200A	4000:5A



PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING		DIAGRAM				
300 SERIES (G3ADTS/G3NDTS) 3PH 1000-3200 AMPS						
"G" FRAME GROUP G CONTROLS						
DRAWN BY	TR	DATE	1/9/14	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005	ASSEM. REF. NO.	COMPUTER GENERATED DRAWING
CHECKED	BK	DATE	1/9/14	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE NONE SIZE DS
PROJECT APPROVAL	BK	DATE	1/9/14	DWG. NO.		1001665
FINAL APPROVAL				DRAWING D		REV. 1
ASCO		ASCO POWER TECHNOLOGIES, L.P.		FLORHAM PARK, NEW JERSEY 07932 U.S.A.		
REV. 1		ECN NO. 275211		SHEET 4 OF 7		

D

C

B

A

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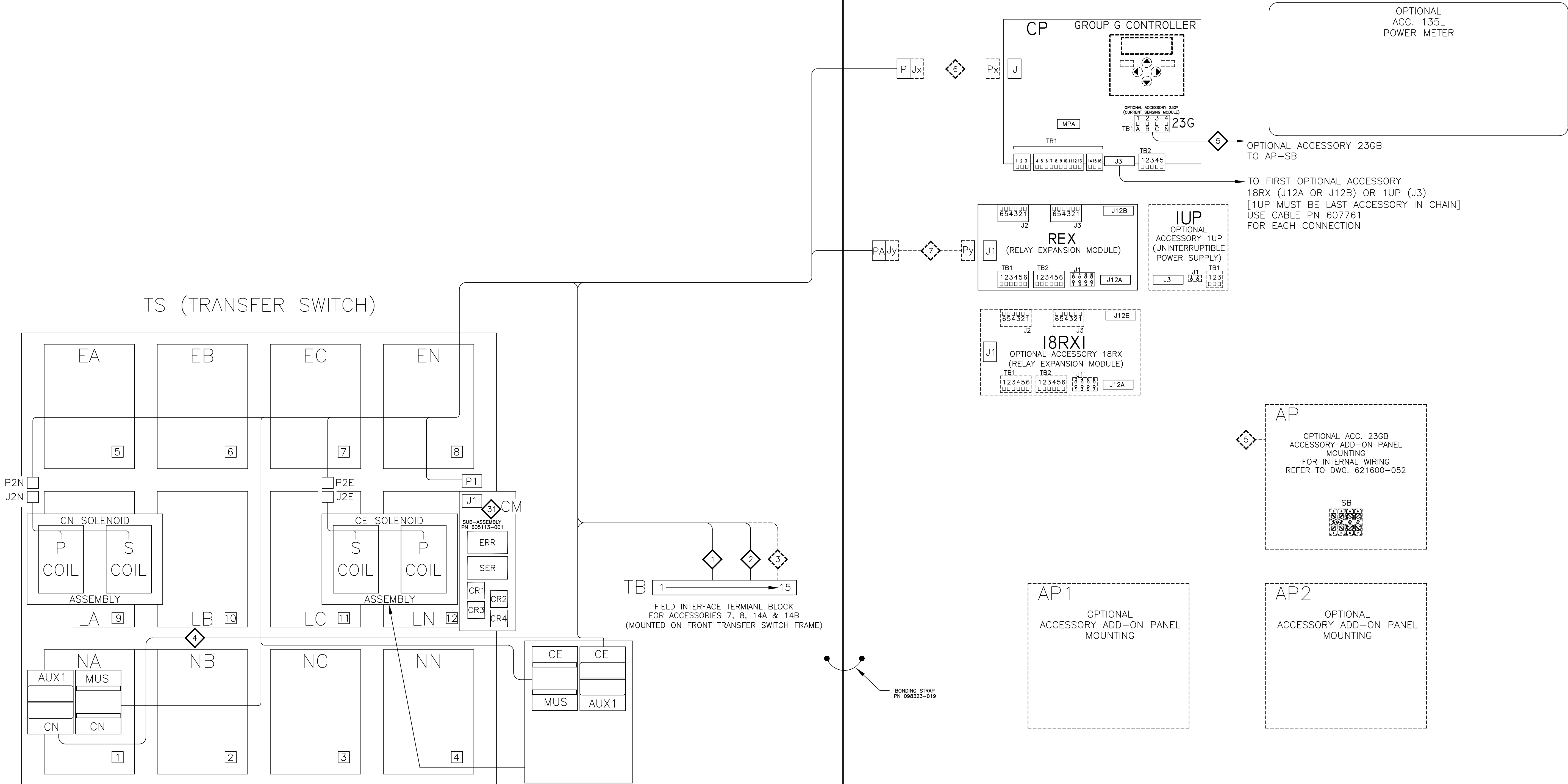
B

A

PHYSICAL DIAGRAM

ENCLOSURE

DOOR, INSIDE



NOTE: PHYSICAL MAY VARY BASED ON ENCLOSURE PROVIDED.

D	275211	TR	BK	10/15/18
SEE ECN				
C	248503	AE	BK	05/21/14
SEE ECN				
B	247774	SDH	SDH	4/14/14
SEE ECN				
A	246325	AE	BK	01/16/14
SEE ECN				
—	246168	TR	BK	1/9/14
ISSUE				
REV. TO SHEET	ECN NO.	BY	APP.	DATE
PROJECT NAME: WIRING DIAGRAM				
300 SERIES (G3ADTS/G3NDTS) 3PH 1000-3200 AMPs "G" FRAME GROUP G CONTROLS				
DRAWN BY	TR	DATE	1/9/14	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.
CHECKED	BK	DATE	1/9/14	PROPERTY OF ASCO POWER TECHNOLOGIES, L.P. WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
PROJECT APPROVAL	BK	DATE	1/9/14	ASCO POWER TECHNOLOGIES, L.P. FLOHAM PARK, NEW JERSEY 07932 U.S.A.
FINAL APPROVAL				
SCALE	NONE	SIZE	DS	COMPUTER GENERATED DRAWING
DWG. NO.	1001665	REV.	ECN NO. 275211	SHEET 5 OF 7

D

C

B

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PHYSICAL DIAGRAM (CONTINUED)

REAR CONNECTED SWITCH
1000 – 3200 AMP. TS REAR VIEW

OPTIONAL ACCESSORY 23GB
(LOAD CURRENT METERING)

MAIN BUS STABS/TERMINALS (TYPICAL)

EN
EMERGENCY
NEUTRAL

EC
EMERGENCY
PHASE C

EB
EMERGENCY
PHASE B

EA
EMERGENCY
PHASE A

LN
LOAD
NEUTRAL

LC
LOAD
PHASE C

LB
LOAD
PHASE B

LA
LOAD
PHASE A

NN
NORMAL
NEUTRAL

NC
NORMAL
PHASE C

NB
NORMAL
PHASE B

NA
NORMAL
PHASE A

FRONT CONNECTED SWITCH
1000 – 2000 AMP. TS TOP VIEW

OPTIONAL ACCESSORY 23GB
(LOAD CURRENT METERING)

LA
LOAD
PHASE A

LB
LOAD
PHASE B

LC
LOAD
PHASE C

LN
LOAD
NEUTRAL

EA
EMERGENCY
PHASE A

EB
EMERGENCY
PHASE B

EC
EMERGENCY
PHASE C

EN
EMERGENCY
NEUTRAL

BOTTOM VIEW

NA
NORMAL
PHASE A

NB
NORMAL
PHASE B

NC
NORMAL
PHASE C

NN
NORMAL
NEUTRAL

LA
LOAD
PHASE A

LB
LOAD
PHASE B

LC
LOAD
PHASE C

LN
LOAD
NEUTRAL

OPTIONAL:
EMERGENCY OUT OF THE TOP
AND NORMAL & LOAD
OUT THE BOTTOM.

D	275211	TR	BK	10/15/18
SEE ECN				
C	248503	AE	BK	05/21/14
SEE ECN				
B	247774	SDH	SDH	4/14/14
SEE ECN				
A	246325	AE	BK	01/16/14
SEE ECN				
—	246168	TR	BK	1/9/14
ISSUE				

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM				
300 SERIES (G3ADTS/G3NDTS) 3PH 1000-3200 AMPS								
"G" FRAME GROUP G CONTROLS								
DRAWN BY				TR	DATE	1/9/14		
CHECKED				BK	DATE	1/9/14		
PROJECT APPROVAL				BK	DATE	1/9/14		
FINAL APPROVAL					DATE			
MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.				ASSEM. REF. NO.		COMPUTER GENERATED DRAWING		
PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				SCALE		NONE	SIZE	DS
DRAWING D				ECN NO.		275211		SHEET 6 OF 7

D

C

B

A

WIRE RUN LISTING

[illegible][illegible][illegible][illegible][illegible]

D	275211	TR	BK	10/15/18
	SEE ECN			
C	248503	AE	BK	05/21/14
	SEE ECN			
B	247774	SDH	SDH	4/14/14
	SEE ECN			
A	246325	AE	BK	01/16/14
	SEE ECN			
—	246168	TR	BK	1/9/14
ISSUE				

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM		 THIRD ANGLE PROJECTION		
300 SERIES (G3ADTS/G3NDTS) 3PH 1000-3200 AMPS								
"G" FRAME GROUP G CONTROLS								
BY		DATE		MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS USE MP-1-005		ASSEM. REF. NO.		
DRAWN BY		TR 1/9/14		COMPUTER GENERATED DRAWING				
CHECKED		BK 1/9/14		SCALE		SIZE		DS
PROJECT APPROVAL		BK 1/9/14		DWG. NO. 1001665				
FINAL APPROVAL				DRAWING D				
				ECN NO. 275211		SHEET 1		OF 7
 ASCO ® ASCO POWER TECHNOLOGIES, L.P. FLOHAM PARK, NEW JERSEY 07932 U.S.A.								

Limited Warranty



Series 150, 200, 300 and 4000 Series Power Transfer Switches

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General:

ASCO Power Technologies, LP products and systems are in our opinion the finest available. We take pride in our products and are pleased you have chosen them. Under certain circumstances we offer with our products the following Twenty Four Month Limited Warranty Against Defects in Material and Workmanship.

Please read your Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

TWENTY FOUR MONTH LIMITED WARRANTY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP ASCO PRODUCTS COVERED:

Product Description	Series	Catalog Code
Automatic Transfer Switch	150, 200	1ATS, 2ATS
	300	3ATS, 3ADTS
	4000	4ATS, 4ADTS, 4ACTS
Non Automatic Transfer Switch (Electrically Operated)	300	3NTS, 3NDTS
	4000	4NTS, 4NDTS, 4NCTS
Manual Transfer Switch	300	3MTS
Service Entrance Transfer Switch (SEATS)	300	3AUS, 3ADUS, 3APS, 3ARS
Power Transfer Load Center (PTLC)	300	300L
Quick Contact Panels	300	3QC

LIMITED WARRANTY:

ASCO warrants that the ATS will be free from defects in material and workmanship and will conform to ASCO's standard specifications for the ATS for a period of twenty four (24) months from date of product shipment from ASCO (the "Warranty Period"). This Limited Warranty does not extend to subsequent owners of the structure during the Warranty Period.

Terms of Warranty:

The foregoing Limited Warranty is conditioned upon User's compliance with the following:

1. The ASCO Power Transfer Switch is installed in accordance with ASCO specifications and state and local codes and standards by an electrician licensed in the state of installation.

2. The ASCO Power Transfer Switch is maintained in accordance with ASCO instructions and used under normal conditions for the purposes intended by ASCO.

All warranty field-related repairs, replacements or adjustments must be made by ASCO Services Inc. or its duly authorized representative.

Optional Available Extended Warranty

Optional extended warranty coverage may be purchased from ASCO for a specified fee at the time of the original sale. If purchased, warranty period shall be extended up to an additional thirty - six (36) months beyond the standard twenty - four (24) months to provide up to five (5) year coverage applicable to the above referenced products, except for 3AUS, 3APS, and 3ARS products where the warranty period for the circuit breaker shall be limited to 24 months from date of shipment from ASCO. The length of optional extended coverage shall be reflected on the ASCO invoice and/or order acknowledgement document.

Warranty Extends to First Purchaser for Use, Non-transferable:

This Warranty is extended to the first person, firm, association or corporation for whom the ASCO product specified herein is originally installed for use (the "User") in the fifty United States or Canada. This Warranty is not transferable or assignable without the prior written permission of ASCO.

Assignment of Warranties:

ASCO assigns to User any warranties which are made by manufacturers and suppliers of components of, or accessories to, the ASCO product and which are assignable, but ASCO makes NO REPRESENTATIONS as to the effectiveness or extent of such warranties, assumes NO RESPONSIBILITY for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components or accessories.

Drawings, Descriptions:

ASCO warrants for the period and on the terms of the Warranty set forth herein that the ASCO product will conform to the descriptions contained in the certified drawings, if any, applicable thereto, to ASCO's final invoices, and to applicable ASCO product brochures and manuals current as of the date of product shipment ("Descriptions"). ASCO does not control the use of any ASCO product. Accordingly, it is understood that the Descriptions are NOT WARRANTIES OF PERFORMANCE and NOT WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

Warranty Claims Procedure:

Within a reasonable time, but in no case to exceed thirty (30) days, after User's discovery of a defect, User shall contact **ascopowerwarranty@ascopower.com**. Subject to the limitations specified herein, an ASCO Services field service representative will repair the non-conforming ASCO product warranted hereunder, without charge for parts, labor, or travel expenses. Warranty coverage will apply only after ASCO's inspection discloses the claimed defect and shows no signs of treatment or use that would void the coverage of this Warranty . All defective products and component parts replaced under this warranty become the property of

ASCO.

Warranty Performance of Component Manufacturers:

It is ASCO's practice, consistent with its desire to remedy Warranty defects in the most prompt and effective manner possible, to cooperate with and utilize the services of component manufacturers and their authorized representatives in the performance of work to correct defects in the product components. Accordingly, ASCO may utilize third parties in the performance of Warranty work, including repair or replacement hereunder, where, in ASCO's opinion, such work can be performed in less time, with less expense, or in closer proximity to the ASCO product.

Items Not Covered By Warranty:

THIS WARRANTY DOES NOT COVER DAMAGE OR DEFECT CAUSED BY misuse, improper application, wrong or inadequate electrical current or connection, negligence, inappropriate on site operating conditions, repair by non-ASCO designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, water, or other corrosive liquids or gases, Acts of God, theft or installation contrary to ASCO's recommendations or specifications, or in any event if the ASCO serial number has been altered, defaced, or removed.

THIS WARRANTY DOES NOT COVER shipping costs, installation costs, external circuit breaker resetting or maintenance or service items and further, except as may be provided herein, does NOT include labor costs or transportation charges arising from the replacement of the ASCO product or any part thereof or charges to remove or reinstall same at any premises of User.

REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT OR PART THEREOF DOES NOT EXTEND THE ORIGINAL WARRANTY PERIOD.

THE PRODUCTS LISTED IN THIS WARRANTY ARE NOT FOR USE IN THE CONTROL AREA OR ANY REACTOR CONNECTED OR SAFETY APPLICATIONS OR WITHIN THE CONTAINMENT AREA OF A NUCLEAR FACILITY OR FOR INTEGRATION INTO MEDICAL DEVICES.

Limitations:

THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

USER'S SOLE AND EXCLUSIVE REMEDY IS REPAIR OR REPLACEMENT OF THE ASCO PRODUCT AS SET FORTH HEREIN.

IF USER'S REMEDY IS DEEMED TO FAIL OF ITS ESSENTIAL PURPOSE BY A COURT OF COMPETENT JURISDICTION, ASCO'S RESPONSIBILITY FOR PROPERTY LOSS OR DAMAGE SHALL NOT EXCEED THE NET PRODUCT PURCHASE PRICE.

IN NO EVENT SHALL ASCO ASSUME ANY LIABILITY FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES OF ANY KIND WHATSOEVER, INCLUDING WITHOUT LIMITATION LOST PROFITS, BUSINESS INTERRUPTION OR LOSS OF DATA, WHETHER ANY CLAIM IS BASED UPON

THEORIES OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT, OR OTHERWISE.

Miscellaneous:

NO SALESPERSON, EMPLOYEE OR AGENT OF ASCO IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. Warranty terms may be modified, if at all, only in writing signed by an ASCO officer.

ASCO obligations under this Warranty are conditioned upon ASCO timely receipt of full payment of the product purchase price and any other amounts due. ASCO reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to User or others.

In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the warranty period, the remaining terms and provisions shall continue in full force and effect.

This Warranty shall be governed by, and construed under, the laws of the State of New Jersey, without reference to the conflict of laws principles thereof.

This Warranty represents the entire agreement between ASCO and User with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings or agreements relating to this subject.



Flexible Power Transfer Solutions for Commercial & Industrial Applications

ASCO Power
Technologies™

ASCO SERIES 300
Power Transfer Switches



ascopower.com

Life Is On

Schneider
Electric

ASCO SERIES 300 Automatic Transfer Switches

Power outages impact small and large facilities alike. ASCO SERIES 300 Automatic Transfer Switches offer rugged design and reliable performance to small and mid-size commercial and industrial facilities in packaged solutions that are easy to select, procure, install, and operate.

Every SERIES 300 generator transfer switch is engineered with ASCO's reliability expertise in a package that makes backup power accessible for small and mid-size facilities. Leveraging knowledge derived from a century of critical power transfer experience, each SERIES 300 is backed by the same ASCO technical support and service that solves the most demanding critical power challenges facing facilities today.

Product Details

[Transfer Switch Overview](#)



ASCO's SERIES 300 lineup offers flexible backup power solutions for businesses of every size.

SERIES 300 Automatic Transfer Switches

Designed to Fit Anywhere

The ASCO SERIES 300 product line provides the most compact design of generator power transfer switches in the industry.

Available to mount on walls or floors, all models through 2000 amperes are designed to be completely front-accessible. This permits installation flush against walls while allowing installation of cabling and connections from the front of the switch. Cable entrance plates are standard on 1600 and 2000 amperes units; these allow use of optional side-mounted pull boxes for additional cable bending space.

- 30 through 3000 amperes in compact designs
- Up to 600 VAC, single or three phase
- Listed to UL 1008 - Standard for Safety - Transfer Switch Equipment
- True double-throw operation: The single solenoid design is inherently interlocked to prevent simultaneous connections of two power sources.
- Will not transfer to a dead source - single solenoid operator derives power from the destination source
- Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not-in-auto mode, and alert conditions.
- Integrated, multilingual, user interface for configuration and monitoring
- Available Delayed Transition operation
- Non-automatic operation can be selected without opening enclosure door
- Optional Relay Expansion Module with extra relays for accessory outputs
- Soft keys for test function and time delay bypass
- Emergency source failure alert indication
- Optional Historical Event Log
- Displays statistical ATS monitoring information
- Built-in diagnostic functions
- Password protection to prevent unauthorized actions
- Adjustable delay feature prevents nuisance transfer due to momentary utility power outages and generator dips
- Auxiliary contacts signal position of main contacts - two for normal and two for emergency position
- Standard solid neutral terminals
- Restriction of Hazardous Substances (RoHS) compliant controller
- Standard 2 year warranty. Optional 1, 2, and 3 year extensions

Power Knowledge

[Basic Automatic Transfer Switch Functions](#)



SERIES 300 Power Transfer Switch rated 200 amps

SERIES 300 Automatic Switching Solutions

Automatic and Non-Automatic Transfer Switching

ASCO Transfer Switches are available in both automatic and non-automatic types. Both are electrically operated. For automatic transfer switches, the controller initiates transfer between power sources. For non-automatic transfer switches, a user initiates transfer using local or remote controls.

SERIES 300 non-automatic transfer switches offer the following features:

- Models range from 30 through 3000 amperes, up to 600V
- Source acceptability lights inform operator when sources are available to accept load
- Controller prevents inadvertent operation under low voltage conditions
- Standard in-phase monitor for transferring motor loads between live sources

Power Knowledge

[Non-Automatic and Manual Transfer Switches for Backup Power Applications](#)

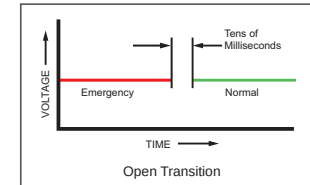


400 Amp, Type 1 Enclosure

Open Transition Transfer Switching

ASCO Transfer Switches are available with a standard, 2-position, open transition models that reliably transfer loads in less than 100 milliseconds. Open transition switches are suitable for a wide range of applications.

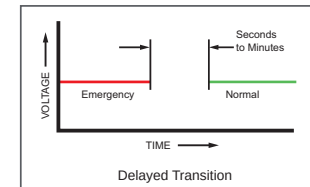
- 30 to 3000 amps
- Single-operator switching mechanism prevents simultaneous connection of both sources
- Available In-Phase Monitor can be activated for transferring motor loads



Delayed Transition Transfer Switching

ASCO Delayed Transition Transfer Switches transfer loads between power sources using a timed load disconnect position with an adjustable delay.

- 150 through 3000 amps
- Reliable, field-proven, dual-solenoid operating mechanism
- Mechanical interlocks to prevent simultaneous connection of both power sources
- Adjustable delay for load disconnect - 0 to 5 minutes
- Non-automatic models available in manual operation configuration
- Automatic models available with load shed feature



Power Knowledge

[Transition Mode Basics](#)

[Transferring Motor Loads between Power Sources](#)

[Transferring Loads with Zero Power Interruption](#)

SERIES 300 Group G Controller

The SERIES 300 Group G Controller is reliable and field-proven. It provides all of the voltage, frequency, control, timing, and diagnostic functions required for most emergency and standby power applications.



- Touch pad programming
- Displays active timers
- On-board diagnostics
- Password protection
- Voltage and frequency sensing
- Status and control functions

Product Details

[Group G Controller](#)

EQUIPMENT STORAGE REQUIREMENTS

Equipment provided by Schneider-Electric and/or ASCO Power Technologies that is stored for a short-term duration (i.e., days to weeks) or long-term duration (i.e., months to years), must be kept in a cool, dry, temperature-controlled environment. Storage of equipment in open warehouses, locations without proper temperature and humidity control, and/or outdoor storage is not acceptable without the utilization of heating elements, thermostats, humidistats, and protection from weather and dirt. Failure to comply may result in moisture ingress and/or condensation to form resulting in rusting and or corrosion, component and/or equipment failure and replacement, and/or nullification of any manufacturer warranty.

For **General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less**, refer to [ANSI NEMA PB 2.1-2013](#)

Copies of the following documents should be included on the submittals, depending on the units that are on the proposal:

For ASCO Power Technology's **Switchgear and Switchboards**, refer to Instruction Bulletin **381333-393**.

For Schneider-Electric/Square D's **Power Zone 4 (PZ4) Switchgear**, refer to Instruction Bulletin **80298-002-09**.

For Schneider-Electric/Square D's **Power Zone 4 (PZ4) NEMA 3R Walk-In Switchgear**, refer to Instruction Bulletin **80298-156-02**.

For Schneider-Electric/Square D's **Quality, Efficient, Delivery" (QED2) Switchboard**, refer to Instruction Bulletin **80043-055-14**.

For Schneider-Electric/Square D's **Masterclad Metal-Clad Indoor Switchgear**, refer to Instruction Bulletin **6055-30**.

PROJECT MANUAL

Ocoee WWTF Electrical Upgrade and Expansion - Rebid

ITB #24-008



March 2024

Prepared by:

City of Ocoee & CPH, LLC

CITY OF OCOEE

ITB #24-008

Ocoee WWTF Electrical Upgrade and Expansion - Rebid

TABLE OF CONTENTS

DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS

<u>SECTION</u>	<u>TITLE</u>
00010	Legal Advertisement
00020	Invitation to Bid
00100	Instructions to Bidders
00200	Information Available to Bidders
00300	Bid Form
00301	Questionnaire
00301a	Subcontractor & Supplier List
00302	Compliance with Florida Trench Safety Act
00303	Drug-Free Workplace Certification
00310	E-Verify Certification
00311	SAM Registration
00312	Byrd Anti-Lobbying Certification
00313	Confidential Disclosure Agreement
00314	Answers to Questions received and/or Amendments to the Bidding Documents
00410	Bid Bond
00480	Non-Collusion Affidavit
00480a	Conflict of Interest Disclosure
00481	Certification of Non-segregated Facilities
00482	Sworn Statement on Public Entity Crimes
00483	Certification of Nondiscriminatory Labor Practices
00484	Certification Regarding Scrutinized Companies' List
00500	Contract for Construction
00610	Performance Bond
00620	Statutory Payment Bond
00630	Construction Performance and Payment Bonds
00640	Waiver of Right to Claim Against the Payment Bond (Final Payment)
00650	Insurance Certificates
00710	Standard General Conditions of the Construction Contract

DIVISION 1 – GENERAL REQUIREMENTS

01001	General Requirements
01070	Abbreviations & Symbols
01200	Project Meetings
01270	Measurement and Payment
01300	Submittals
01301	Product Substitution
01310	Administrative Requirements
01315	Pre-construction Video
01320	Project Completion Schedule
01450	Quality Control
01520	Temporary Facilities and Controls
01610	Delivery, Storage and Handling
01730	Operation and Maintenance Manual
01740	Warranties and Bonds
01770	Contract Closeout
01780	Record Drawings

DIVISION 2 – SITE WORK

02220	Site Demolition
02230	Site Preparation
02240	Dewatering
02250	Compaction Control and Testing
02310	Finish Grading
02315	Excavation and Fill
02320	Trenching, Bedding, and Backfilling
02370	Erosion and Sedimentation Control
02740	Paving
02910	Landscaping
02920	Lawns and Grasses

DIVISION 3 - CONCRETE

03100	Concrete Forms
03150	Concrete Accessories
03300	Concrete

APPENDIX “A” – TECHNICAL REPORT

Professional Service Industries’ Subsurface Report

APPENDIX “B” – SPECIFIC TECHNICAL SPECIFICATION

City of Ocoee Engineering Standards Manual

APPENDIX “C” – INSTRUCTIONS AND CONTRACT FORMS

SECTION 00840	Instructions for Contract Forms
FORM 00840	Notice of Award
FORM 00841	Notice to Proceed
FORM 00842a	Change Order - City Commission
FORM 00842b	Change Order - City Manager
FORM 00843	Substantial Completion
FORM 00844	Non-compliance
FORM 00845	Field Order & Directive
FORM 00846	Schedule of Values
FORM 00847	Proposed Change
FORM 00848	Daily Construction Report
FORM 00861	Pay App - Application for Payment
FORM 00863	Final Release of Lien
FORM 00864	Shop Drawings
FORM 00865	Final Inspection
FORM 00868	Request for Info
FORM 00879	Waiver & Lien Release
FORM 00881	Progress Lien Release
FORM 00883	Final Affidavit
FORM 00885	Interim Affidavit

DIVISION 0

BIDDING AND CONTRACT REQUIREMENTS

SECTION 00010

LEGAL ADVERTISEMENT

The City of Ocoee, Florida, (“City”) is soliciting sealed bids for the following project: **ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid**, which is an ARPA federal grant funded project. Bids will only be accepted electronically through Bonfire, a free e-Procurement platform, **until 2:00 pm, local time, on Monday, April 8, 2024**. Bids received after that time or through any other method will not be accepted under any circumstances. Sealed Bids that have been timely received will be publicly opened, virtually online and the name of each bidder and price submitted will be read aloud at that time; instructions will be provided at <https://www.ocoe.org/959/Public-Bid-Meetings>. All questions regarding this ITB shall be in writing and directed to Shannon Hopper, Purchasing Technician, shopper@ocoe.org. Prospective Bidders may secure a copy of the documents required for submitting a bid at no charge through Bonfire by accessing the City’s published solicitation page at <https://ocoe.bonfirehub.com>. For more information, visit <https://www.ocoe.org/323/Purchasing>. Prospective Bidders will be provided with all information regarding this ITB, addenda, and changes to the project requirements through the Bonfire e-Procurement Platform. Melanie Sibbitt, City Clerk, Orlando Sentinel, March 9, 2024.

SECTION 00020

INVITATION TO BID

ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid

The City of Ocoee, Florida (“City”, “Owner”) is soliciting sealed Bids for the Project **ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid**. The Project is one of the City’s designated utilities projects federal grant funded through the American Rescue Plan Act (ARPA) / Coronavirus State and Local Fiscal Recovery Funds (SLFRF). All procurements by Federal Grant recipients and sub-recipients shall comply with the provisions of 2 C.F.R. Section 200.317 – 327, as applicable. Proper documentation is required by the American Rescue Plan Act, per the federal requirements and corresponding forms.

This is a rebid; however, prospective bidders are responsible for thoroughly reviewing all of the documents in this rebid and the changes made to the Bid Form.

Description of Work: The Work shall be performed under a General Contractor license. All Work for the Project shall be constructed in accordance with the drawings and specifications and the Project Manual prepared by CPH, LLC and the City of Ocoee. Bids shall be deemed to include all items necessary for the furnishing, delivering, and installing of all materials, equipment, incidentals, and services, including all labor for the Work which is generally described as the following:

- A. The project will consist of, but is not limited to, the following:
 - i. Construct one (1) Electrical Building and furnish and install new electrical equipment
 - ii. Install new 1000 KW generator with weatherproof sound-attenuating walk-in type enclosure and belly tank (generator, automatic transfer switches, and fuel monitoring system to be provided by the City)
 - iii. Construct blower pad and install new blowers (blowers to be provided by the City)
 - iv. Demolish existing generator, diesel fuel tank, transformer, sidewalk and aboveground blower piping
 - v. Furnish and install electrical conduit and electrical pullboxes.
 - vi. Construct generator pad, grade site and install new concrete sidewalks.
 - vii. Construct transformer pad per Duke Energy Specifications
 - viii. Remove existing asphalt pavement and replace with concrete pavement. Patch all removed asphalt pavement (not covered by concrete) with full-depth asphalt.
- B. Furnish all materials, equipment, tools, and labor which is reasonably and properly inferable and necessary for the proper completion of the Work, whether specifically indicated in the Contract Documents or not.
- C. All permits, licenses and fees, other than those permits included in the appendices shall be secured and paid for by the CONTRACTOR.
- D. Repair, replace, or otherwise settle with the Owner, if damage to property or existing facilities occurs, including damage to pavements, utilities, lawns, structures, etc.
- E. Construct the Project under a single lump sum contract.

The City is ONLY accepting electronic solicitation responses online through the City's Bonfire platform at <https://ocoe.bonfirehub.com>. This link can also be accessed through the City's website at <https://www.ocoe.org/323/Purchasing> under the Current Open Solicitations menu. All Bid submissions for this ITB MUST be submitted electronically through the Bonfire Platform. Bid submissions received in any other format will not be accepted; no paper, fax, or e-mailed submissions will be accepted. There is no charge for bidders to use the Bonfire e-procurement platform. Bonfire platform's minimum system requirements: Microsoft Edge, Google Chrome, Safari, or Mozilla Firefox. JavaScript and browser cookies must be enabled.

Registration with Bonfire is free and is required prior to submitting a bid. It is suggested that prospective bidders register no later than 24 hours in advance of the bid submission deadline to ensure proper registration. Should a Bidder need assistance with registering, please contact the Bonfire Support Desk by emailing support@gobonfire.com. Support by email is provided Monday to Friday from 8:00 a.m. – 8:00 p.m. EST/EDT.

Upon completing the registration with Bonfire, bidders will be able to submit a bid securely, any time before the bid submission deadline, at <https://ocoe.bonfirehub.com> by clicking the "PREPARE YOUR SUBMISSION" under the solicitation. An instructional video is provided for an overview of the submission process. Once the bid has been submitted, the Bidder will receive a date/time stamp confirmation within the Bonfire platform and an email confirmation of the bid submission. Bids submitted on the Bonfire Platform will remain locked and inaccessible by City staff until the bid deadline. Bidders are encouraged to allow ample time to upload and submit their Bid as the system will automatically lock upon the bid submission deadline. The actual contract award will be made by the Ocoee City Commission at a later date. Please be aware that all City Commission meetings are duly noticed public meetings and all documents submitted to the City as a part of a bid constitute public records under Florida law.

Bid Submission Deadline: Bids will only be accepted electronically through the Bonfire Platform **until 2:00 p.m., local time, on Monday, April 8, 2024.** Bidders shall submit one (1) complete electronic copy, preferably in a single file, of their Bid on the Bonfire Platform. Bids must be received by Bonfire no later than the bid submission deadline. It shall be the sole responsibility of the Bidder to have its Bid **uploaded and submitted** on the Bonfire Platform prior to the due date and time. Any attempt to submit a bid after the submission deadline will not be accepted under any circumstances. Any uncertainty regarding the time a bid is received will be resolved against the Bidder. A virtual public bid opening will be held at approximately 2:01 pm. or as soon thereafter. Once available, the details on how to access the virtual bid opening will be posted in the project file on Bonfire and available on the City's website at <https://www.ocoe.org/959/Public-Bid-Meetings>.

Deadline for Receipt of Questions: The City will receive questions regarding this ITB only through written inquiries directed to Shannon Hopper, Purchasing Technician at shopper@ocoe.org OR through the questions and answer section of the project file on Bonfire until **March 28, 2024 at 2:00 p.m., local time.** Any clarifications/changes will be made by way of written addenda only, issued by Purchasing and posted on Bonfire. Bidders should not contact City staff, with the exception of the Purchasing Technician, or other City consultants for information regarding this ITB before the Bid award date. Any contact with any other member of City Staff, City Commission, or its agents during the solicitation, award, and protest period may be grounds for disqualification.

Pre-Bid Conference: A pre-bid conference is not scheduled for this project.

Site Visit: To coordinate a site visit, contact Shannon Hopper through the project file on Bonfire or by email at shopper@ocoe.org.

Bid Bond: A certified check or bid bond shall accompany each Bid. The certified check or bid bond shall be for an amount not less than five percent (5%) of the bid price, and shall be made payable to the City of Ocoee as a guarantee that the Bidder will not withdraw for a period of ninety (90) days after bid closing time.

Convicted Vendor List (Public Entity Crime). A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid on an award to provide any goods or services to a public entity, may not submit a bid on an award with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Contractor, Supplier, Subcontractor, or Consultant under a award with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in section 287.017 for Category Two for a period of 36 months from the date of being placed on the convicted vendor list. See s. 287.133(2)(a), Florida Statutes.

The City reserves the right to accept or reject any or all bids, to waive formalities, technicalities or irregularities, to request clarification of information submitted in any bid, or to re-advertise for new bids. The City may accept any item or group of items of any bid, unless the Bidder qualifies its bid by specific limitations. The City may accept one or more bids if, in the City's discretion, the City determines that it is in the City's best interest to do so. The City reserves the right to negotiate with the low bidder(s).

The City reserves the right to award the contract to the Bidder which, in the City's sole discretion, is the most responsive and responsible Bidder. The City reserves the right, as an aid in determining which bid is responsible, to require a bidder to submit such additional evidence of Bidder's qualifications as the City may deem necessary, and may consider any evidence available to the City of the financial, technical, and other qualifications and abilities of a Bidder, including past performance (experience) with the City and others. The City Commission shall be the final authority in the selection of any and all bids.

END OF SECTION

SECTION 00100

INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

ARTICLE	<u>DESCRIPTION</u>
1	Defined Terms
2	Copies of Bidding Documents
3	Qualifications of Bidders
4	Examination of Contract Documents and Site
5	Availability of Lands for Work, Etc.
6	Addenda and Interpretations
7	Bid Security
8	Contract Time
9	Liquidated Damages and Indemnity
10	Substitute Material and Equipment
11	Subcontractors, Etc.
12	Bid Form
13	Submission of Bids
14	Modification and Withdrawal of Bids
15	Opening of Bids
16	Bids to Remain Open Subject to Acceptance
17	Award of Contract
18	Taxes
19	Organization of Drawings and Specifications
20	Required Disclosure
21	Qualifications of Surety Companies
22	Qualifications Submittals
23	Interpretation of Quantities
24	Drug-Free Workplace
25	Construction Safety
26	Special Warranty, Performance Bond, Insurance and Correction Period Requirements
27	Signing of Agreement
28	Bid Protests
29	Unit Prices Information
30	Licenses and Permits
31	Retainage
32	Stored Material Allowance(s)
33	E-Verify
34	Federal Funding (ARPA) Requirements

SECTION 00100

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders that are defined in Section 01001 – General Requirements have the meanings assigned to them in that Section, as supplemented. Terms defined here for general application within the Project Manual are:
- 1.1.1 "Apparent low Bidder" means the Bidder submitting the lowest bid at the bid opening without correction of numerical discrepancies, consideration of alternates, or determination of responsiveness and responsibility.
 - 1.1.2 "Bidding Documents" consist of the Project Manual and related drawings, both as may be modified by addenda.
 - 1.1.3 "Contract Documents" are described in Section 00500, Article 8, and generally include the complete Project Manual, drawings, any addenda issued by Owner or Engineer, Contractor's Bid, Notice to Proceed, and documentation submitted by Bidder prior to the Notice of Intent to Award being issued.
 - 1.1.4 "Contractor" refers to the corporation, firm, or person who is authorized to undertake the Work.
 - 1.1.5 "Engineer" refers to the Utilities Director of the City of Ocoee, or his/her designee, who shall act as Owner's representative and serves as project engineer for all decisions and actions requiring action by "Engineer."
 - 1.1.6 "Owner" is the City of Ocoee, Florida.
 - 1.1.7 "Owner's representative" is the Utilities Director of the City of Ocoee or designee.
 - 1.1.8 "Project Manual" refers to the complete document set, including "Engineering Standards Manual," issued by Owner, as may be amended, not including the drawings.
 - 1.1.9 "Purchasing Technician" for this project is Shannon Hopper, Finance Department/Purchasing, City of Ocoee, shopper@ocoe.org.
 - 1.1.10 "Successful Bidder" means the Bidder to whom Owner awards or expects to award the contract. The apparent low Bidder is not necessarily the successful Bidder.
- 1.2 The work, as defined in Section 00500 – Scope of Work Agreement, is governed by the requirements of Section 00710 – General Conditions, and, if applicable, Section 00800 – Supplemental Conditions.

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

- 2.1 Prospective Bidders may secure a free copy of the documents required for submitting a Bid through the Bonfire platform by accessing the City's published solicitation page at <https://ocoe.bonfirehub.com>. Prospective Bidders will be provided with all information regarding this ITB, addenda, and changes to the project requirements through the Bonfire platform; there is no charge to use the Bonfire platform. Partial sets of the documents required for submitting a Bid will not be issued.
- 2.2 Complete sets of bidding documents shall include 11" x 17" drawings.
- 2.3 Owner, in making copies of the bidding documents available on the above terms, does so only for the purpose of obtaining bids on the work and does not confer a license or grant for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

Each Bidder shall complete the questionnaire (Section 00301) included in the Bid Form. Owner reserves the right to reject and/or disqualify any Bidder not meeting the Minimum Requirements for this invitation to bid as indicated on the Questionnaire. To demonstrate qualifications to perform the work, each Bidder must be prepared to submit, within seven (7) days of Owner's request, the additional qualifications submittals set forth in Article 22 of the Instructions to Bidders.

ARTICLE 4 - EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 4.1 It is the responsibility of each Bidder before submitting a Bid to: (a) examine thoroughly the Contract Documents and other related data identified in the Bidding Documents; (b) visit the site to become familiar with the general and local conditions that may affect cost, progress, performance, or furnishing of the work; (c) consider federal, state, and local laws and regulations that may affect cost, progress, performance, or furnishing of the work; (d) study and carefully correlate Bidder's knowledge and observations with the Contract Documents and such other related data; and (e) promptly notify Purchasing Technician of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in or between the Contract Documents and such other related documents or conditions prior to submitting a bid.
- 4.2 Information and data shown or indicated in the Contract Documents with respect to existing underground facilities at or contiguous to the site are based upon information and data furnished to Owner and Engineer by owners of such underground facilities or others, and Owner and Engineer do not assume responsibility for the accuracy or completeness thereof.
- 4.3 Contractor shall perform exploratory excavations for the purpose of locating underground pipelines, conduits, cables or structures in advance of the construction.

- 4.4 Before submitting a Bid, each Bidder will be responsible for obtaining such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise, which may affect cost, progress, performance, or furnishing of the work, or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder, and safety precautions and programs incident thereto or that Bidder deems necessary to determine its bid for performing and furnishing the work in accordance with the time, price, and other terms and conditions of the Contract Documents.
- 4.5 Each Bidder has access to the public portions of the construction area to conduct such examinations, investigations, explorations, tests, and studies as each Bidder deems necessary for submission of a bid. Bidder must fill all holes and clean up and restore the site to its former condition upon completion of such explorations, investigations, tests, and studies.
- 4.7 The submission of a bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4; that without exception the bid is premised upon performing and furnishing the work required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents; that Bidder has given Purchasing Technician written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Contract Documents and the written resolutions thereof by Purchasing Technician are acceptable to Bidder; and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the work.
- 4.8 The submission of the Bid shall be an indication that the Bidder has considered normal local weather conditions (daily and monthly variations) and accounted for these circumstances in the preparation of the bid and schedule of construction.

ARTICLE 5 - AVAILABILITY OF LANDS FOR WORK, ETC.

- 5.1 The lands upon which the work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by Contractor in performing the work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the work are to be obtained and paid for by Contractor. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.
- 5.2 Each Bidder is instructed to fully acquaint himself or herself with the status of easement acquisitions by the Owner at the time of submission of his or her bid and the possibility that additional parcels may remain to be acquired. The Contractor shall sequence and schedule the work to delay schedule impacts caused by un-acquired easements so as not to interfere with the progress of the work in other areas of the Project. The Owner shall not

be liable for any damage that may occur to the Contractor for any and all delay through delay of the Owner in securing the necessary right-of-way. The Owner agrees that it shall make every effort to acquire such easements, if any, with all reasonable speed and diligence.

ARTICLE 6 - ADDENDA AND INTERPRETATIONS

- 6.1 Bidders shall promptly notify Purchasing Technician of any ambiguity, inconsistency, or error that they may discover upon examination of the Bidding Documents or the site before submitting a Bid.
- 6.2 All questions about the meaning or intent of the Bidding Documents shall be submitted to Purchasing Technician in writing by e-mail or through the question and answer section of the project file on Bonfire. Bidders shall not contact other City staff, members of the City Commission, or City's or consultants before the award date with reference to this Invitation to Bid. **Any contact with other members of City staff, the City Commission, or their agents or consultants during the bid, award, and protest period may be grounds for Bidder disqualification.**
- 6.3 **The deadline for receipt of questions is March 28, 2024 at 2:00 p.m. local time.** Questions received after the deadline, may not be answered. Submitted questions and their replies considered relevant to other Bidders, if any, shall be published through addenda posted on Bonfire no later than twenty-four (24) hours before bid time. Only questions answered by formal written addenda shall be binding. Prospective Bidders are warned that no source other than formal written addenda is authorized to give information supplementing, explaining, or interpreting the Bidding Documents. Failure of any Bidder to receive any such addendum or interpretation shall not relieve such Bidder from its terms and requirements.
- 6.4 Owner reserves the right to suspend, cancel, or postpone bid opening without prior notice in response to emergencies, loss of and/or unattainable funds, and other unexpected conditions. An addendum will be published at the earliest reasonable opportunity notifying bidders of such an event and the time of any new bid opening date.

ARTICLE 7 - BID SECURITY

- 7.1 Each Bid must be accompanied by Bid Security in the form of a Cashier's/Certified Check upon an incorporated bank or trust company or a Bid Bond in an amount equal to five percent (5%) of the amount of the bid and submitted on the attached Bid Bond Form. A combination of any of the former is not acceptable. Cash will not be accepted as Bid Security. The Bid Security is submitted as a guarantee that Bidder, if awarded the Contract, will after written notice of such award, enter into a written Contract with the City and as a guarantee that Bidder will not withdraw its Bid for a period of ninety (90) days after the scheduled closing time for the receipt of bids, in accordance with the accepted bid and bid documents. Please note checks will be deposited.

- 7.2 A copy of the bid security is to be included with the bid submitted electronically Bonfire. The original bid security is to be mailed within five (5) business days after the bid opening to: City of Ocoee, Finance Department/Purchasing, Attention: Shannon Hopper, Purchasing Technician, 1 N. Bluford Avenue, Ocoee, FL 34761. Failure to provide the original may cause your bid to be deemed non-responsive.
- 7.3 In the event of withdrawal of said Bid within ninety (90) days following the opening of bids, or Bidder's failure to enter into said contract with the City or failure to provide the City with other requirements of the Contract Documents or the bid invitation after issuance of Notice of Intent to Award by the City, then such Bidder shall be liable to the City in the full amount of the Bid Security and the City shall be entitled to retain the full amount of the check or to demand from the Surety the penal sum of the bid bond as liquidated damages and not a penalty.
- 7.4 Surety companies executing bonds shall be duly insured by an insurer or corporate surety and signed by a licensed agent who holds a current Power of Attorney from the surety company issuing the bond.
- 7.5 The cost of the required bond and required insurance coverage is to be included in Bidder's overhead and is not eligible for reimbursement as a separate cost by the City.
- 7.6 The bid security of any Bidder whom Owner believes to have a reasonable chance of receiving the award will be retained by Owner until the City and successful bidder have executed the contract for work or until the ninety-first (91st) day after the bid opening, whichever is earlier. Bid security, in the form of a cashier's check, of other Bidders will be returned approximately thirty (30) days after the bid opening. Bid security, in the form of a bid bond, will be returned upon request following the same criteria as the cashier's check. The bid security of the successful Bidder shall be retained until such Bidder has executed the Agreement and furnished the required payment and performance bonds, whereupon the bid security shall be returned. If the successful Bidder fails to furnish the required qualifications or submittals; or fails to execute and deliver the Agreement and furnish the required bonds within ten (10) days of the Notice of Award, Owner may rescind the Notice of Award and the bid security of that Bidder shall be forfeited.

ARTICLE 8 - CONTRACT TIME

The number of consecutive calendar days within which, or the date by which, the work is to be completed (the Contract Time) is set forth in the Scope of Work Agreement (Section 00500).

ARTICLE 9 - LIQUIDATED DAMAGES AND INDEMNITY

- 9.1 Provisions for liquidated damages are set forth in the Scope of Work Agreement (Section 00500, Article 3).

- 9.2 The liquidated damages amount of Section 00500 has been established in accordance with the Florida Department of Transportation's *Standard Specifications for Road and Bridge Construction*, 2004 Edition, and supplements and revisions thereto.

ARTICLE 10 - SUBSTITUTE MATERIAL AND EQUIPMENT

The work, if awarded, shall be awarded on the basis of material and equipment described in the drawings or given in the specifications with consideration of possible substitute items identified by the reference, "or equal." Whenever it is indicated in the drawings or stated in the specifications that a substitute item of material or equipment may be furnished or used by Contractor, if acceptable to Owner's representative, then application for such acceptance shall not be considered by Owner's representative until after the effective date of the Agreement. If a substitution list is provided as part of the prescribed Base Bid Form, Bidders must identify proposed substitute materials. These substitute materials and equipment shall be evaluated after the effective date of the Agreement. Only the proposed alternatives and substitution items listed on the Substitution List shall be evaluated by the Owner's representative. The cost of changes in related work and/or production of additional drawings that may be required to illustrate or define the alternate equipment and its relationship to the other parts or portions of the work shall be paid by Contractor. No change shall be made in the amount of time in which to complete the work or in the liquidated damages. If the proposed substituted material or equipment is found to be unacceptable to the Owner's representative as an "equal" item, then the base bid material or equipment named in the specification or City's Approved Materials List shall be furnished by the Contractor.

ARTICLE 11 - SUBCONTRACTORS, ETC.

- 11.1 Each Bid must identify the names and addresses of the subcontractors listed in the bid form titled, "Subcontractor/Supplier List (Section 00301-A)." If requested by the Purchasing Technician, the Bidder, and any other Bidder so requested, shall, within seven (7) days after the date of the request, submit to Owner an experience statement with pertinent information as to similar projects and other evidence of qualification for each such subcontractor, person, and organization. If Owner or its representative, after due investigation, has reasonable objection to any proposed subcontractor, other person, or organization, then Owner may, before giving the Notice of Award, request Bidder to submit an acceptable substitute without an increase in contract price or contract time. If the Bidder declines to make any such substitution, Owner may elect not to award the work to such Bidder. A Bidder's declining to make any such substitution shall not constitute grounds for sacrificing his bid security. No Bidder shall be required to employ any subcontractor, other person, or organization against whom Bidder has reasonable objection.
- 11.2 Procedures for approval of other subcontractors after execution of the Agreement are through written submittal to and approval by Owner's representative.

- 11.3 Each Bidder must complete the Bid form titled, "Subcontractor/Supplier List" (Section 00301-A) listing each item of work to be subcontracted and the estimated not-to-exceed cost of these items. (Work in this respect does not include cost paid to suppliers for materials and equipment furnished for this project.)

ARTICLE 12 - BID FORM

- 12.1 The Bid form may not be completed in pencil. All entries on the Bid form shall be legible. The City reserves the right, but does not assume the obligation, to ask a Bidder to clarify an illegible entry on the Bid form. If the Bid form requires that the Bid price, or constituent portions of the Bid price, be stated in unit prices and total price; the unit prices and the total price for the stated number of units identified on the Bid form should be provided by the Bidder and be correctly computed. If there is an arithmetical conflict, between the unit price stated by the Bidder on the Bid form and the total price stated by the Bidder on the Bid form, the unit price stated by the Bidder on the Bid form shall take precedence. The City may unilaterally correct such arithmetical conflict on the Bid form to calculate the total price, utilizing the unit prices that have been identified by the Bidder. The taking of such action by the City shall not constitute grounds for the Bidder to withdraw its bid nor shall it provide a defense constituting discharge of the bid bond. The City reserves the right, but does not assume the obligation, to waive any mistake, omission, error or other irregularity that may appear on the Bid form. However, the City reserves the right to reject as non-responsive Bid forms that are incomplete or contain information that is not required.
- 12.2 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer, if accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary of the corporation. The corporate address and state of incorporation must be shown below the signature. If requested, the person signing a bid for a corporation or partnership must produce evidence satisfactory to Owner of the person's authority to bind the corporation or partnership. If the Bidder is a corporation, and if the bid is executed by someone other than the President or Vice President of the corporation, attach to the bid a certified copy of corporate resolutions of the board of directors of the corporation authorizing the person to execute the bid on behalf of the corporation.
- 12.3 Bids by partnerships must be executed in the partnership's name and signed by a partner, whose title must appear under the signature. The official address of the partnership must be shown below the signature.
- 12.4 All names and titles must be typed or printed below the signature.
- 12.5 The Bid shall contain an acknowledgment of receipt of all addenda (the numbers of which shall be indicated on the bid form).
- 12.6 The Bidder's address to which communications regarding the bid are to be directed must be shown.

- 12.7 Evidence of authority to conduct business in the State of Florida as an out-of-state corporation shall be provided in accordance with Paragraph 12.2, above. Florida contractor's license number, if any, must also be shown.
- 12.8 Bids must be priced on a lump-sum basis for the base contract and include a separate price for each line item, as provided in the bid form. Some line items on the bid form are for unit prices with a bid quantity stated. The actual installed quantity may differ, with the unit price being multiplied by the actual number of units required. However, the Owner reserves the right to renegotiate the unit price whenever the installed quantity is significantly different from the bid quantity. In this context, "significantly different" is defined as being of sufficient magnitude so as to alter the price basis of the materials and/or services supplied to the Contractor, either up or down, for the line item.
- 12.9 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on all line items. There is no additional line item on the bid form for these elements of the total price.
- 12.10 Bids that are incomplete or conditional, or that contain additions not called for, alterations, or irregularities of any kind, may be rejected.
- 12.11 Indemnification shall be incidental to the contract and no direct pay shall be made for indemnification.
- 12.12 The Bid price for Mobilization/Demobilization may not exceed five percent (5%) of the Total Bid price less this bid item.

ARTICLE 13- SUBMISSION OF BIDS

- 13.1 All Bids submissions for this ITB MUST be submitted electronically online through the City's Bonfire Platform <https://ocoe.bonfirehub.com>. Bid submissions received in any other format will not be accepted; no paper, fax, or e-mailed submissions will be accepted. Bidders shall submit one (1) complete electronic copy, preferably in a single file, of their Bid on the Bonfire Platform. Bids must be received by Bonfire no later than the submission deadline stated in the invitation to bid. Any attempt to submit a bid after the submission deadline will not be accepted under any circumstances. Any uncertainty regarding the time a bid is received will be resolved against the Bidder. It shall be the sole responsibility of the Bidder to have the bid **uploaded and submitted** on the Bonfire Platform prior to the due date and time.
- 13.2 **File Uploads** – Submission materials should be prepared in the file formats listed under Requested Information for this opportunity in the Bonfire Platform. The maximum upload file size is 1000 MB. Documents should not be embedded within uploaded files, as the embedded files will not be accessible or evaluated. All electronic files uploaded must be in a common format accessible by software programs the City uses. Those common formats are generally described as Microsoft Word (.doc or .docx), Microsoft Excel (.xls or .xlsx), Microsoft Power Point (.ppt or pptx), or Adobe Portable Document Format

(.pdf). Respondents will not secure, password protect or lock uploaded files; the City must be able to open and view the contents of the file. Respondents will not disable or restrict the ability of the City to print the contents of an uploaded file. Scanned documents or images must be of sufficient quality, no less than 150 dpi, to allow for reading or interpreting the words, drawings, images or sketches. The City may disqualify any Submittal Response that does not meet the criteria stated in this paragraph.

- 13.3 Upon completing the registration with Bonfire, bidders will be able to submit a bid securely, any time before the bid submission deadline, at <https://ocoe.bonfirehub.com> by clicking the “PREPARE YOUR SUBMISSION” under the solicitation. An instructional video is provided for an overview of the submission process. Once the bid has been submitted, the Bidder will receive a date/time stamp confirmation within the Bonfire platform and an email confirmation of the bid submission. Bids submitted on the Bonfire Platform will remain locked and inaccessible by City staff until the bid deadline. Bidders are encouraged to allow ample time to upload and submit their Bid as the system will automatically lock upon the bid submission deadline. The actual contract award will be made by the Ocoee City Commission at a later date. Please be aware that all City Commission meetings are duly noticed public meetings and all documents submitted to the City as a part of a bid constitute public records under Florida law.
- 13.4 Each Bid must contain the forms and documents stated in Section 300.
- 13.5 More than one bid received for the same work from an individual, firm, partnership, corporation, or association under the same or different names shall not be considered. Reasonable grounds for believing that any Bidder is interested in more than one bid for the same work shall cause the rejection of all such bids in which the Bidder has an interest. If there are reasonable grounds for believing that collusion exists among the Bidders, the bids of participants in such collusion shall not be considered.

ARTICLE 14 - MODIFICATION AND WITHDRAWAL OF BIDS

- 14.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a bid must be executed) and delivered to the place where bids are to be submitted at any time prior to the deadline for submitting bids. A request for withdrawal or a modification must be in writing and signed by a person duly authorized to do so; and, in case it is signed by a deputy or subordinate, the principal's proper written authority to such deputy or subordinate must accompany the request for withdrawal or modification. Withdrawal of a bid shall not prejudice the rights of a Bidder to submit a new bid prior to the bid date and time. After expiration of the period for receiving bids, no bid may be withdrawn, modified, or explained.
- 14.2 Within twenty-four (24) hours after bids are opened, any Bidder may withdraw its bid and the bid security shall be returned, provided that Owner is not materially prejudiced, and the Bidder files a duly signed written notice with Owner. Any such withdrawal is conditioned on Bidder demonstrating within forty-eight (48) hours to the reasonable satisfaction of Owner that: (a) there has been a material and substantial mistake in the preparation of the

bid; (b) the mistake is of such great consequence that to enforce the bid would be unconscionable; and (c) the mistake occurred notwithstanding the exercise of reasonable care in the preparation of the bid.

- 14.3 Following the 24-hour period during which a bid may be withdrawn as a result of one of the three causes noted above in Section 14.2, bids may not be withdrawn without being subject to the loss of bid security, regardless of the cause, including the discovery of a mistake resulting from Owner's correcting bid item prices and/or the total bid price.

ARTICLE 15 - OPENING OF BIDS

- 15.1 Except for bids that are facially or patently non-responsive, bids shall be opened publicly and read aloud at the time and place indicated in the Invitation to Bid (Section 00020).
- 15.2 Owner reserves the right to suspend, cancel, or postpone bid opening without prior notice in response to emergencies, loss of funds, and other unexpected conditions. An addendum will be published at the earliest reasonable opportunity notifying bidders of such an event and the time of any new bid opening date.
- 15.3 An abstract (tabulation) of the amounts of the bids received will be prepared by the Owner and made available to all Bidders within ten (10) days of the bid opening. Owner reserves the right to modify the bid abstract at any time subsequent to posting in order to reflect issues that may arise up to the time of award.

ARTICLE 16 - BIDS TO REMAIN OPEN SUBJECT TO ACCEPTANCE

- 16.1 All bids shall remain open for delivery by Owner of the Notice of Award for ninety (90) calendar days after the day of the bid opening.
- 16.2 Extensions of time when bids shall remain open beyond the ninety (90) day period may be made only by mutual agreement between Owner, the Bidder, and the surety, if any, for the Bidder.

ARTICLE 17 - AWARD OF CONTRACT

- 17.1 To the extent permitted by applicable state and federal laws and regulations and Owner's purchasing rules and procedures, Owner reserves the right to reject any or all bids, including, without limitation, the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids and to reject the bid of any Bidder if Owner believes that it would not be in the best interest of the project to make an award to that Bidder, whether because the bid is not responsive, the Bidder is unqualified or of doubtful skill or ability, the Bidder fails to meet any other pertinent standard or criteria established by Owner, or the bid is irregular. Bids may be considered irregular and subject to rejection if they show serious omission, unauthorized alterations of form, unauthorized alternate bids, incomplete or unbalanced unit prices, excessive loading of project costs on fixed-cost (lump sum) components of the work, or other irregularities of any kind. Owner also reserves the right

to waive all informalities not involving price, time, or changes in the work, and to negotiate contract terms with the Bidder. (Discrepancies between the multiplication of units of work and unit prices will be resolved in favor of the unit prices.) (Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.) Bids may be corrected or rejected by Owner at any time prior to award.

- 17.2 Invited Alternate Bids, if any, that are determined by Owner, in its sole discretion, to be acceptable may be considered in determining the lowest responsive and responsible Bidder. In evaluating bids, Owner may consider the qualifications of the Bidders; and the prescribed requirements, bid alternates, unit prices, and other information, as may be requested in the Bid Form or by other means prior to the Notice of Award.
- 17.3 The Owner shall award the contract pursuant to applicable law. Owner specifically reserves the right to award the contract to a Bidder other than the lowest responsive Bidder when, in Owner's sole discretion, Owner determines that action to be in its best interests. Owner, in its sole discretion, reserves the right to reject any and all bids and to waive any informality concerning bids whenever such rejection or waiver is in the best interest of Owner. If all bids exceed the amount of funds estimated by Owner to be available to finance the project, Owner may reject all bids. The Owner reserves the right to rescind any award of a contract if anticipated funding for the project becomes unavailable. The ability of a Bidder to obtain a performance and payment bond shall not be regarded as the sole test of such Bidder's competency or responsibility. Nothing contained herein shall place a duty upon Owner to reject bids or award a contract based upon anything other than its sole discretion, as described herein. By submitting a bid, Bidder recognizes and accepts that Owner may reject the bid based upon the exercise of Owner's sole discretion, and Bidder waives any claim it might have for damages or other relief resulting from the rejection of its bid based on these grounds.
- 17.4 Owner may consider the qualifications and experience of subcontractors proposed for those portions of the work for which the identity of subcontractors must be submitted in conformance with Articles 11 and 22 of these Instructions to Bidders (Section 00100).
- 17.5 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications, and ability of Bidders, proposed subcontractors, and other persons and organizations to perform the work in accordance with the Contract Documents within the prescribed time to Owner's satisfaction. Owner reserves the right to reject the bid of any Bidder that does not pass any such evaluation to Owner's satisfaction.
- 17.6 The responsive Bidder must complete the bid schedule for the contemplated work. Owner intends to award one (1) contract, if any award is made, to the lowest responsive and responsive Bidder. The Successful Bidder shall be required to perform the Work as a prime contractor. No assignment of the contract shall be allowed without the prior written permission of Owner.

- 17.7 If a contract is to be awarded, Owner will give the successful Bidder a Notice of Intent to Award not later than ninety (90) days after the date of the bid opening.

ARTICLE 18 - TAXES

Contractor shall pay all applicable sales, consumer, use, and other similar taxes required by law. Contractor shall comply with all applicable federal, state, and local requirements.

ARTICLE 19 - ORGANIZATION OF DRAWINGS AND SPECIFICATIONS

Drawings and specifications for the work are incorporated as:

- 19.1 Project Manual consisting of Division 0 - Bidding and Contract Requirements, Division 1- General Requirements, Division 2- Site Work, Division 3- Concrete, Appendix A- Professional Service Industries' Report, Appendix B- Ocoee Engineering Standards Manual, Appendix C- Contract Forms.
- 19.2 Drawings, separately bound and with the general title, "City of Ocoee, Ocoee WWTF Electrical Upgrade and Expansion."
- 19.3 Technical specifications may also be reflected or identified on the Drawings.

ARTICLE 20 - REQUIRED DISCLOSURE

- 20.1 Any contractor submitting a bid in response to this invitation must execute form PUR. 7068, SWORN STATEMENT UNDER SECTION 287.133(3)(A), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES, including proper check(s), in the space(s) provided, and enclose it with his or her bid. The required disclosure form (Section 00482) must be completed by the appropriate individual within the organization, include a notarized signature of an authorized person, and be provided with the Bid. Corrections to the form will not be allowed after the bid opening time and date. Failure to complete this form in every detail and to submit it with the bid may result in disqualification.
- 20.2 SCRUTINIZED COMPANIES: The Respondent certifies that the company is not participating in a boycott of Israel. The Respondent certifies that the Respondent is not on the Scrutinized Companies that Boycott Israel List, not on the Scrutinized Companies with Activities in Sudan List, not on the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria, as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that the Respondent is unable to provide such certification but still seeks to be considered for award of this solicitation, the Respondent shall, on a separate piece of paper, clearly state that it is on one or both of the Scrutinized Companies lists and shall furnish together with its proposal a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. The Respondent agrees to cooperate fully with the City in any investigation undertaken by the City to determine whether the claimed exception would be applicable. The City shall have the right to terminate any contract resulting from this

solicitation for default if the Respondent is found to have submitted a false certification, or to have been placed on the Scrutinized Companies that Boycott Israel List, or to have been placed on the Scrutinized Companies for Activities in Sudan List, or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria.

- 20.3 Owner has the sole discretion to reject any Bidder whose present or former employees, officers, directors, stockholders, partners, or owners are found by Owner to lack high standards of honesty, integrity, or responsibility. The discretion of Owner may be exercised based on the disclosure required herein, Owner's own investigation, public records, or any other reliable sources of information. Owner may also reject any Bidder failing to make the disclosure required herein. By submitting a bid, Bidder recognizes and accepts that Owner may reject the bid based upon the exercise of its sole discretion and Bidder waives any claim it might have for damages or other relief resulting from the rejection of its bid based on these grounds.
- 20.4 **Prohibition Against Considering Social, Political or Ideological Interests in Government Contracting:** Bidders are hereby notified of the provisions of section 287.05701, Florida Statutes, as amended, that the City will not request documentation of or consider a Bidder's social, political, or ideological interests when determining if the Bidder is a responsible Bidder. Bidders are further notified that the City's governing body may not give preference to a Bidder based on the Bidder's social, political, or ideological interests.
- 20.5 **Convicted Vendor List (Public Entity Crime).** A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid on an award to provide any goods or services to a public entity, may not submit a bid on an award with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Contractor, Supplier, Subcontractor, or Consultant under a award with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in section 287.017 for Category Two for a period of 36 months from the date of being placed on the convicted vendor list. See s. 287.133(2)(a), Florida Statutes.
- 20.6 **Florida Public Records Law.** In accordance with Chapter 119, Florida Statutes, and, except as may be provided by Chapter 119, Florida Statutes, and other applicable State and Federal Laws, all Bidders should be aware that the Bid and the responses thereto are in the public domain and are available for public inspection. Bidders are requested, however, to identify specifically any information contained in their bids that they consider confidential and/or proprietary and that they believe to be exempt from disclosure, citing specifically the applicable exempting law. All bids received in response to this Invitation to Bid become the property of the City and will not be returned. In the event of an award, all documentation produced as part of the contract will become the exclusive property of the City.

ARTICLE 21 - QUALIFICATIONS OF SURETY COMPANIES

In order to be acceptable to Owner, a surety company issuing bid guaranty bonds, or 100 percent performance/ payment bonds, or 25 percent maintenance bonds called for in the Bidding Documents shall meet and comply with the following minimum standards:

- 21.1 Surety company shall comply with the provisions of s. 255.05, Florida Statutes.
- 21.2 Surety companies executing bonds must appear on the United States Treasury Department's most current list (Circular 570, as amended).
- 21.3 Attorneys-in-fact who sign bid bonds or performance/payment bonds must file with such bond a certified copy of their power of attorney to sign such bond.
- 21.4 Agents of surety companies must list their name, address, and telephone number on all bonds.
- 21.5 Surety shall have at least the following minimum ratings:

<u>CONTRACT AMOUNT</u>		<u>BEST'S RATINGS</u>
to 50,000	Class IV	B+ or better
50,000 to 500,000	Class V	A or better
500,000 to 2,500,000	Class VI	A or better
2,500,000 and over	Class VII	A or better

RATINGS SCHEDULE (net worth of bonding company)

Class IV	3,750,000 to 5,000,000
Class V	7,500,000 to 12,500,000
Class VI	25,000,000 to 50,000,000
Class VII	75,000,000 to 100,000,000

- 21.6 All bonds must be provided on the forms contained in the Bidding Documents. Failure to provide bonds on Owner's forms may result in the rejection of the bid and the forfeiture of the bid security.

ARTICLE 22 - QUALIFICATIONS SUBMITTALS

- 22.1 It is the intention of Owner to award this contract to a Bidder competent to perform and complete the work in a satisfactory manner. Accordingly, Owner shall require the successful Bidder to submit prior to award of any contract: (a) evidence of Bidder's certification and license to perform the work and services; (b) experience statement; (c) a preliminary progress schedule; (d) a preliminary schedule of values; and (e) such business references as may be required to evaluate the Bidder's performance on work of a similar nature.

- 22.2 The experience statement shall provide data additional to that information provided in the bid form pertaining to Contractor's adequacy of plant and equipment, organization, and prior experience. Owner may specifically request certain items to be addressed in the experience statement.
- 22.3 The preliminary progress schedule shall consist of three copies of a diagram and a narrative prepared in accordance with the formats set forth in Paragraph 2.05 of Project Manual Section 00710 – General Requirements for an initial work schedule and written narrative. (Note that the preliminary progress schedule is only prepared in a manner consistent with the initial work schedule; it does not constitute the initial work schedule, which is prepared within twenty-one (21) days following contract execution.) Activities in the diagram shall show the order in which the Bidder proposes to perform the work within the constraints and sequencing conditions set forth in the specification and shall indicate starting and completion dates for key milestones and work pertaining to each division of the specifications within each major structure or geographical area of work. Activities shall further identify significant submittals/approvals, major deliveries, testing, Owner's responsibilities, and responsibilities of affected utilities and other similarly involved third parties. The preliminary progress schedule shall not replace, but serve as a basis for, the progress schedule submittals to be developed later in conformance with the requirements of Paragraph 2.07 of Project Manual Section 00710 – General Requirements.
- 22.4 It is assumed that the schedule of values under which progress payments and change order negotiations will be based is the same as the bid prices. If this is not the case, the preliminary schedule of values shall consist of an itemization of the unit-price bid items listed in the bid form. It may also modify lump-sum items when the nature of the work changes to such a degree as to affect that part of the project.
- 22.5 The successful Bidder and its surety, if any, hereby agree that any delays within Bidder's control in the delivery of these qualifications submittals shall constitute a request by Bidder for an extension of the time during which the bid shall remain open for Owner's acceptance. Should Owner agree to such extension, Bidder shall be required to comply with this submittal requirement within five (5) additional days. At Owner's option, failure by the successful Bidder to deliver these qualifications submittals within the extended period shall void evaluation of the bid and shall constitute proof that the successful Bidder has abandoned his bid, the Bidder's bid security may be declared forfeited to Owner as liquidated damages, and the work may be awarded to another Bidder.
- 22.6 If, upon receipt and evaluation of the submittals, the successful Bidder does not pass the evaluations to Owner's satisfaction, Owner reserves the right to reject the bid.

ARTICLE 23 - INTERPRETATION OF QUANTITIES

In the case of unit-price items, the quantities of work to be done or materials to be furnished, as identified in the bid form provided in the Bidding Documents, are to be considered as approximate only and are to be used solely for the comparison of bids

received. The Owner and/or its representative do not expressly, or by implication, represent that the actual quantities involved shall correspond exactly therewith; nor shall the Bidder plead misunderstanding or deception because of such estimate or quantities or of the character, location, or other conditions pertaining to the work. Payment to the Contactor shall be made only for the actual quantities of work performed or material furnished in accordance with the Drawings and other Contract Documents, and it is understood that the quantities may be increased or decreased, as provided in the General Conditions, without, in any way, invalidating any of the unit or lump-sum prices bid, provided that the parties may negotiate changes to unit prices under the provisions of Section 12.8, above.

ARTICLE 24 - DRUG-FREE WORKPLACE

Every Bidder shall provide a certification on the form provided (Section 00303) indicating whether the Bidder has implemented a drug-free workplace program pursuant to the requirements of Section 287.087, Florida Statutes. Preference in the award process shall be given, according to the statutory requirements, to a business that certifies it has implemented a drug-free workplace program.

ARTICLE 25 - CONSTRUCTION SAFETY

- 25.1 In instances where such is applicable due to the nature of the work matter with which this bid is concerned, all materials, equipment, etc., as proposed and offered by Bidders must meet and conform to all Occupational Safety and Health Act (OSHA) requirements. The Bidders' signature upon the Bid Form (Section 00300) is considered certification of conformance to such requirements.
- 25.2 In the event this contract requires trench excavation, the requirements of Florida Statutes 553.60, et seq., shall be adhered to by all Bidders and acknowledged on Form 00302. All costs associated with complying with these requirements shall be included in the offered price for any applicable bid item(s).

ARTICLE 26 - SPECIAL WARRANTY, PERFORMANCE BOND, INSURANCE, AND CORRECTION PERIOD REQUIREMENTS

Detailed requirements pertaining to warranty, performance bond, insurance, and the correction period are described elsewhere in the Bidding Documents. Bidders are hereby notified that, in the event of an overpayment to Contractor as a result of an error on the part of either party in the preparation and/or processing of change orders, invoices, or other documents affecting the cost of the work, Contractor will refund any such overpaid amount within ten (10) calendar days of notification by Owner via certified U.S. mail of the overpayment. This obligation of Contractor is not limited to the term of the construction project.

ARTICLE 27 - SIGNING OF AGREEMENT

- 27.1 When Owner gives a Notice of Intent to Award to the successful Bidder, Owner will provide two (2) unsigned Agreements and all other Contract Documents shall accompany it. Within ten (10) days of receipt, successful Bidder shall sign and deliver the Agreements to Owner together with the required bonds, insurance certificates, and endorsements. Owner must be satisfied with regard to the submitted documents prior to its execution of the Agreement. In addition, the award is contingent upon action of the City Commission of the City of Ocoee, at which time the Mayor of the City of Ocoee may be authorized to sign the Agreement. Within ten (10) days after Owner signs the Agreement, Owner shall deliver a fully signed copy of the Agreement to the successful Bidder (Contractor).
- 27.2 A successful Bidder that is awarded the Work and fails to execute the Agreement or furnish the required bonds or insurance certificates and endorsements within the period specified in Paragraph 27.1, above, shall have its Notice of Intent to Award rescinded and shall forfeit its bid security to Owner as liquidated damages for its failure to enter into a contract with Owner.

ARTICLE 28 - BID PROTESTS

All Bid Protests shall be submitted to the Purchasing Technician at shopper@ocoe.org with a copy to the Procurement Manager at jtolbert@ocoe.org in the following manner:

- 28.1 A Bidder **shall** file a written bid protest under this Article or be barred any relief; oral protests shall not be acknowledged.
- 28.2 A bid protest **shall** be limited to the following grounds: (a) issues arising from the procurement provisions of the Project Manual, its addenda, and other Bidding Documents; and/or (b) applicable federal, state, or local law. No bid protest may be based upon questions concerning the design documents (drawings and specifications). The Bidder shall clarify all questions concerning the design documents of the project prior to submitting its bid.
- 28.3 The content of the bid protest **shall** fully state the factual and legal grounds for the protest and the legal basis for the relief requested.
- 28.4 The bid protest **shall** be filed with the Purchasing Technician with a copy to the Procurement Manager not later than five (5) calendar days after the posting of the Notice of Intent to Award or Recommendation of Award by staff, whichever is earlier.
- 28.5 The Procurement Manager or Purchasing Technician, on behalf of the Owner, shall make a determination of the merits of the protest not later than five (5) business days after receipt of the protest. If Owner denies the protest, Owner may proceed with award of the contract unless enjoined by order of a court of competent jurisdiction.

ARTICLE 29 - UNIT PRICES INFORMATION

- 29.1 Within thirty (30) days after the effective date of the Agreement, the Contractor shall submit a detailed list of unit prices (schedule of values) to be used as a basis to negotiate change orders, if such prices are proposed to differ from the unit prices included in the Bid Form. Otherwise, the bid unit prices will be used for change orders, subject to the provisions of Section 12.8, above. The successful Bidder shall submit a detailed breakdown of unit costs for performing additional work or deleting work of the types requested by Owner or Owner's representative.
- 29.2 The information supporting the proposed unit prices proposed in a schedule of values shall be submitted in sufficient detail to allow comprehensive analysis and review, shall show all "Cost of the Work," as defined in Article 11 of the General Conditions (Section 00710), and shall be in accordance with generally accepted accounting principles and applicable government regulations. Owner and the appropriate State agency(ies) shall have the right to audit these costs.
- 29.3 If Owner accepts such proposed unit prices, in whole or in part, they shall be binding on the Contractor for change orders to the extent of such acceptance and subject to any ancillary terms and conditions such as escalation clauses. However, if the Owner rejects all or any portion of such proposed unit prices, the parties shall rely on the provisions of Article 11 of the General Conditions (Section 00710), as supplemented, for changes in contract price (to the extent of such rejection). Owner may accept or reject such unit prices at its sole discretion.

ARTICLE 30 - LICENSES AND PERMITS

- 30.1 The contractor shall obtain and pay for all necessary building permits and all right-of-way utilization permits utilizing an allowance provided in the bid schedule (see Division 1 – General Requirements of the bidding documents). **However, any permit required from the City of Ocoee shall be provided by Owner without payment of the usual and customary fee.**
- 30.2 The contractor shall obtain and pay for all other federal, state, and county permits, licenses, and other authorizations required for the prosecution of the work, including the cost of all work performed in compliance with the terms and conditions of such permits, licenses, and authorizations, whether by itself or others.

ARTICLE 31 - RETAINAGE

Provisions concerning retainage and contractors' rights to deposit securities in lieu of retainage are set forth in the Proposed Scope of Work Agreement, Section 00500.

ARTICLE 32 – STORED MATERIAL ALLOWANCE

Provisions concerning stored material allowances are set forth in Sections 00710 & 01025.

ARTICLE 33 – E-VERIFY CERTIFICATION

By entering into the Contract, the awarded Contractor is obligated to comply with the provisions of § 448.095, Fla. Stat., "Employment Eligibility." This includes, but is not limited to utilization of the E-Verify System to verify the work authorization status of all newly hired employees, and requiring all subcontractors to provide an affidavit attesting that the subcontractor does not employ, contract with, or subcontract with, an alien unauthorized to work in the USA. Failure to comply will lead to termination of this contract, or if a subcontractor knowingly violates the statute, the subcontractor must be terminated immediately. If the Contract is terminated pursuant to Section 448.095, Fla. Stat., such termination is not a breach of contract and may not be considered as such. Any challenge to termination under this provision must be filed in the Ninth Judicial Circuit Court of Florida no later than 20 calendar days after the date of termination. If the Contract is terminated for a violation of Section 448.095 Fla. Stat., by the Contractor, the Contractor shall be liable for any additional costs incurred by the City as a result of the termination of the Contract. Nothing in the E-Verify Certification shall be construed to allow intentional discrimination of any class protected by law.

E-VERIFY REGISTRATION AND USE.

- A. Pursuant to section 448.095, Florida Statutes, Contractor shall register with and use the U.S. Department of Homeland Security's E-Verify system, <https://e-verify.uscis.gov/emp>, to verify the work authorization status of all Contractor employees hired on and after January 1, 2021.
- B. Subcontractors
 - (i) Contractor shall also require all subcontractors performing work under this Agreement to use the E-Verify system for any employees they may hire during the term of this Agreement.
 - (ii) Contractor shall obtain from all such subcontractors an affidavit stating the subcontractor does not employ, contract with, or subcontract with an unauthorized alien, as defined in section 448.095, Florida Statutes.
 - (iii) Contractor shall maintain a copy of all subcontractor affidavits for the duration of the Agreement.
- C. Contractor must provide evidence of compliance with section 448.095, Florida Statutes. Evidence shall consist of an affidavit from the Contractor stating all employees hired on and after January 1, 2021 have had their work authorization status verified through the E-Verify system and a copy of their proof of registration in the E-Verify system.
- D. Failure to comply with this provision is a material breach of the Agreement, and shall result in the immediate termination of the Agreement without penalty to the City. Contractor shall be liable for all costs incurred by the City to secure a replacement Agreement, including but not limited to, any increased costs for the same services, any costs due to delay, and rebidding costs, if applicable.

ARTICLE 34 – FEDERAL FUNDING (ARPA) REQUIREMENTS

- 34.1 All procurements by Federal Grant recipients and sub-recipients shall comply with the provisions of 2 C.F.R. Section 200.317 – 327, as applicable. All procurement transactions shall be conducted in a manner providing full and open competition consistent with the standards of 2 C.F.R. Section 200.317 – 327.
- 34.2 Proper documentation is required by the American Rescue Plan Act, per the federal requirements and corresponding forms.
- 34.3 RETENTION OF RECORDS FOR ARPA PROJECTS. The U. S. Department of Treasury requires records to be maintained for a period of five years for the ARP/CSLFRF award. Contractor shall retain all records for ARPA projects and make available upon request for a period of five (5) years following final payment to the contractor.
- 34.3. For federal grant funded ARPA projects, the Davis-Bacon Act applies to infrastructure projects over \$10 million. Additionally, recipients may be otherwise subject to the requirements of the Davis-Bacon Act, when CSFRF/CLFRF award funds are used on a construction project in conjunction with funds from another federal program that requires enforcement of the Davis-Bacon Act. Wage Determinations can be located at <https://sam.gov/content/wage-determinations>.

END OF SECTION

SECTION 00200

INFORMATION AVAILABLE TO BIDDERS

1. The City reserves the right to award the “Project” based on the Base Bid.
2. This project will be funded in part by the American Rescue Plan Act (ARPA).
3. Utilities: The location and existence of such utilities has been identified by the Owner or Engineer. However, the contractor is responsible to verify all existing utilities located within the project area. If conflict(s) arise requiring modification of the project elements, the contractor shall submit a change order request. The Contractor shall identify and verify the location of all existing utilities and preserve as necessary, applicable existing utilities required to be preserved under The Contract, whether shown on the Drawings or not. If the Contractor encounters utility conflicts during construction, the Contractor shall give sufficient notice to the Owners so that they may make the necessary adjustments. Damage to any utilities that is caused by carelessness of the Contractor shall be repaired at the Contractor's expense. Any delays ensuing from this damage shall be considered a delay that is within the Contractor's control.
4. Permits: The Contractor shall obtain all necessary building permits from City of Ocoee. If fees are required for the City of Ocoee issued permits, the Utilities Department will pay the fee upon notification from the Contractor. The Contractor shall obtain and pay for all other federal, state, and county permits, licenses, and other authorizations required for the prosecution of the Work, including the cost of all Work performed in compliance with the terms and conditions of such permits, licenses, and authorizations, whether by himself or others. The Contractor shall strictly adhere to the specific conditions or requirements of all such permits issued by the governmental unit(s) or agency (ies) having jurisdiction over the Work. Whenever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

The project does not require a SJRWMD permit, FDEP permit, or City Right-of-way Permit.

5. Contract Forms: Contract Forms are part of this manual in Appendix “A”.
6. Geotechnical Data: Subsurface exploration report by Professional Service Industry, Inc. (PSI), an Intertek company.
7. Land Survey: Land Survey is basis of the plan preparation and is available upon request in electronic format (Acad).
8. Ocoee Plans are available in PDF and electronic (Acad) formats upon request.
9. Field Trailer: No field trailer is required for this contract.
10. Bid Form: The enclosed Bid Form is a Unit Item bid form. Contractor's Bid Bond shall be five percent (5%) of the total of the Bid Form.

END OF SECTION

SECTION 00300

BID FORM

SUBMITTED: _____
(Date)

PROJECT IDENTIFICATION: CITY OF OCOEE ITB #24-008
Ocoee WWTF Electrical Upgrade and Expansion - Rebid

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____ PHONE NO.: _____
CITY, STATE, ZIP: _____

CONTRACTOR'S FEDERAL I.D. NUMBER _____

CONTRACTOR'S FLORIDA LICENSE NO.: _____

THIS BID IS SUBMITTED TO: City of Ocoee, Florida (hereinafter called Owner)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to perform and furnish all Work, as specified or indicated in the Contract Documents for the Contract Price and within the Contract Times indicated in this Bid Form and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Bidding Documents, including, without limitation, those dealing with the disposition of Bid Bond. This Bid will remain open for ninety (90) calendar days after the day of Bid opening. Bidder will sign and deliver the required number of counterparts of the Amendment to the Agreement with the Bonds and other documents required by the Bidding Requirements within ten (10) days after the date of Owner's Notice of Intent to Award.
3. In submitting this Bid, Bidder makes all representations required by the Instructions to Bidders and the Agreement and further warrants and represents that:
 - a. Bidder has examined copies of all the Bidding Documents and of the following Addenda:

No. _____	Dated _____	No. _____	Dated: _____
No. _____	Dated _____	No. _____	Dated: _____
No. _____	Dated _____	No. _____	Dated: _____
No. _____	Dated _____	No. _____	Dated: _____

(Receipt of all which is hereby acknowledged) and also copies of the Invitation to Bid and the Instructions to Bidders.

- b. Bidder has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing the Work.
- c. Bidder has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface of subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions, as provided in paragraph 4.02.1 of the General Conditions. Bidder accepts the determination set forth in paragraph SC-4.02 of the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which Bidder is entitled to rely, as provided in paragraph 4.02 of the General Conditions. Bidder acknowledges that such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site.
- d. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work, or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.
- e. Bidder understands the full extent and scope of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted.
- f. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and date with the Contract Documents.
- g. Bidder has given Engineer written notice of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

- h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a farce or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
- i. Bidder hereby agrees to commence Work under this contract on the date to be specified in the Notice to Proceed and to fully complete all work of the project within the Contract Time specified in the Contract for Construction (Section 00500). Bidder further accepts the provisions of the Contract for Construction as to liquidated damages and agrees to pay as liquidated damages the amount stated in the Contract for Construction (Section 00500), for each consecutive calendar day completion of the Work is delayed.

Completion Schedule:

- 1) The Work shall be Substantially Complete within the Contract Time specified in Article 3.1 of the Contract for Construction (Section 00500).
 - 2) The Work shall be finally complete within the Contract Time specified in Article 3.1 of the Contract for Construction (Section 00500).
4. All bid items shall include all materials, equipment, labor, permit fees, taxes, tests, miscellaneous costs of all types, overhead, and profit for the item to be complete, in place, and ready for operation in the manner contemplated by the Contract Documents. Bidder submits the **TOTAL BID OR TOTAL BASE BID** to perform all the Work, as required by the Drawings and Specifications.
5. The following documents are made a condition of this Bid:
- a. **Bidding Documents and shall include the following:**
 - 1. Bid Forms (entire Section 00300, 00301, 00301A, 00302, 00303, 00310, 00311, 00312, 00313, and 00314)
 - 2. Bid Bond (Surety Bond or Cashier's Check) (Section 00410)
 - 3. Non-collusion Affidavit (Section 00480)
 - 4. Conflict of Interest Disclosure Form (Section 00480A)
 - 5. Certification of Non-segregated Facilities (Section 00481)
 - 6. Sworn Statement on Public Entity Crimes (Section 00482)
 - 7. Certification of Nondiscriminatory Labor Practices (Section 00483)
 - 8. Certification Regarding Scrutinized Companies' Lists (Section 00484)

(Remainder of page intentionally left blank)

Bid Form: ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid					
Item No:	Description	Units	Contract Quantity	Unit Price (in Numbers)	Total Price (in Numbers)
1	Mobilization, Bonds, and General Conditions				
1.1	Mobilization/ Demobilization	Lump Sum	1.00		
1.2	General Conditions	Lump Sum	1.00		
1.3	Utility Locates	Lump Sum	1.00		
1.4	Erosion Control	Lump Sum	1.00		
1.5	Construction Photographs and Audio - Visual Recording	Lump Sum	1.00		
1.6	Survey (Horizontal and Vertical Controls & As-Builts)	Lump Sum	1.00		
2	Site Work				
2.1	Demolition	Lump Sum	1.00		
2.2	Fill	Cubic Yards	250.00		
2.3	Grading	Lump Sum	1.00		
2.4	Concrete Sidewalk and Pads	Cubic Yards	75.00		
2.5	Sod	Square Yards	500.00		
2.6	Concrete Parking	Cubic Yards	35.00		
2.7	Bollards	Each	13.00		
2.8	Install (2) Blowers (Blowers Purchased by City of Ocoee)	Lump Sum	1.00		
3	Building				
3.1	Electrical Building	Lump Sum	1.00		
3.2	Electrical Building HVAC	Lump Sum	1.00		
4	Electrical System and Instrumentation Control				
4.1	Electrical Equipment (Not Including 4.11, 4.12, 4.13, 4.14, 4.15)	Lump Sum	1.00		
4.11	Equipment Purchase Only: Motor Control Centers (Spec Section 16921)	Lump Sum	1.00		
4.12	Equipment Purchase Only: Switchboard (Spec Section 16940)	Lump Sum	1.00		
4.13	Equipment Purchase Only: ATS (Spec Section 16250)	Lump Sum	1.00		
4.14	Equipment Purchase Only: Panelboards (Spec Section 16160)	Lump Sum	1.00		
4.15	Equipment Purchase Only: MBI & MB2 (Elect Drawing)	Lump Sum	1.00		
4.2	Furnish and Integrate SCADA (Allowance)	Lump Sum	1.00	486,502.00	486,502.00
4.3	Install 1000 kW Generator (Generator Purchased by City of Ocoee)	Lump Sum	1.00		
				Total Base Bid	
Written Total Base Bid:					

COMPANY NAME: _____
 BID PREPARED BY (PRINT): _____
 SIGNATURE: _____

7. The Bidder acknowledges that the City specifically reserves the right to accept and make an award to a Bidder that has not submitted the lowest Bid when, in Owner's sole and absolute discretion, it determines that action to be in its best interest. The terms used in this Invitation to Bid, which are defined in the General Conditions and included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.
8. The work shall be performed under a Florida General Contractor license. Contract shall not be awarded unless proof of valid license(s) is provided.
9. It is understood that where quantities for unit price work have been presented on the Bid Form, they are approximate only and are solely for the purpose of facilitating the comparison of bids, and that the Contractor's compensation will be computed upon the basis, described in the measurement and payment clauses in the specifications contained herein.
10. **BASE BID - SCHEDULE OF MANUFACTURERS/SUPPLIERS**

If the foregoing Schedule of Bid Items is presented in a Base Bid format, the undersigned as Bidder, agrees that the Contract, if awarded, will be on the basis of the materials and equipment named in the Contract Documents, in accordance with Article 10 of the Instructions to Bidders (Section 00100). The undersigned, as Bidder, also agrees that the Total Bid reflects the equipment and material supplied by one of the manufacturers/suppliers listed in the City's Approved Materials List. If the Bidder desires to propose an alternate manufacturer/supplier, he may write in the name of such alternate in the substitution list included within this Bid Form, but he must, nevertheless, also choose an approved manufacturer/supplier. If the proposed alternate manufacturer/supplier is determined "not equivalent" by the Engineer, the Bidder must furnish equipment and/or material items by the Bidder's chosen approved manufacturer/supplier. If the Bidder fails to indicate which listed manufacturer/supplier he intends to use if an alternate is rejected, he must use the manufacturer/supplier chosen by the City. Also, if the Bidder chooses more than one approved manufacturer/supplier, he must use the first manufacturer/supplier written in the schedule of Base/Alternative Bid Manufactures/Suppliers table within this Bid Form (unless an alternate is approved).

11. **SUBSTITUTIONS AND "OR EQUAL"**

The undersigned as Bidder agrees that substitutions, or "equal," items will not be considered until after the effective date of the Agreement and will be evaluated in accordance with paragraphs 6.05.1 and 6.05.2 of the General Conditions. In addition to the reimbursement required under the General Conditions, the Contractor shall also reimburse the Owner for any engineering costs directly attributable to the change in manufacturers/suppliers caused by the acceptance of proposed alternates, such as, additional field trips for the Engineer, additional redesign costs, additional review costs, etc. Other costs directly attributable to the change in manufacturers/suppliers caused by the acceptance of proposed alternates, such as; increased electrical requirements, larger building, additional pumps or tankage, etc., shall be borne by others and not the Owner. If

Bidder intends to propose substitutions or "equal" items after the effective date of the Agreement, it is agreed that these items must be listed on the Substitution List included within this Bid Form, with a deductive amount representing 50 percent of the total savings between the named Base Bid/Alternative Bid item and the proposed item. "Base Bid/Alternative Bid" item substitutions providing to the Owner equipment or material cost savings of less than \$1,000 will not be considered. The undersigned, as Bidder, also agrees that if a substitution or "equal" item is not listed on the Substitution List included with the Bid, all of the savings between the named item and the proposed item will go to the Owner, if the Owner accepts the proposed item in accordance with paragraphs 6.05.1 and 6.05.2 of the General Conditions. The Owner may request, and the undersigned Bidder shall supply, complete information on proposed substitutions. Such information shall be the manufacturer's current published or preprinted information for the specific substitution.

12. As Bidder, I hereby certify that I am aware and understand that the City of Ocoee in its sole discretion reserves the right to waive technicalities or irregularities, to reject any or all Bids, and/or to accept that Bid which is in the best interest of the City. The award of this Bid, if made, may be based on considerations other than total cost, and may be awarded based on various considerations, including but not limited to: Bidder experience and whether the Bid, in the judgment of the City, is the most responsive to the City's needs.

(Remainder of page intentionally left blank)

SUBSTITUTION LIST			
Bidder offers the following substitutions and "equal" items.			
Equipment Item or Material	Spec Section	Alternative Manufacturer/Supplier (List One Only)	Deductible Amount* (Indicate Whether Lump Sum or Unit Price)
Represents 50 percent of the difference in cost in accordance with the General Conditions (Minimum Deductible Amount per Substitution Item shall be \$1,000) (Bidder may make additional copies of this page as required.)			

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

SOLE PROPRIETORSHIP

(SEAL)

(Individual's Signature)

(Individual's Name)

doing business as

Business Address:

Phone No.:

Florida License No.: _____

A PARTNERSHIP

(SEAL)

(Partnership Name)

(General Partner's Signature)

(General Partner's Name)

Business address:

Phone No.:

Florida License No.: _____

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

A CORPORATION

(Corporation Name)

(State of Incorporation)

By

(Name of person authorized to sign)

(Title)

(Authorized Signature)

(Corporate Seal)

Attest

(Secretary)

Business address:

Phone No.:

Corporation President:

Florida License No.:

Strike out (X) non-applicable signature block and complete applicable block. (ALL SIGNATORIES MUST HAVE THEIR NAMES PRINTED OR TYPED BELOW THEIR SIGNATURES)

If Bidder is:

A JOINT VENTURE

By

(Name)

(Address)

By

(Name)

(Address)

Business Address:

Phone No.:

Florida License No.:

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Florida License No.:

13. List the following in connection with the Surety which is providing the Bid Bond:

Surety's Name: _____

Surety's Address: _____

14. Name and address of Surety's resident agent for service of process in Florida:

(Remainder of page intentionally left blank.)

CORPORATE AUTHORITY TO EXECUTE DOCUMENTS

I HEREBY CERTIFY that a meeting of the Board of Directors of _____,
_____, a corporation under
(Contractor's Corporate Name)
the laws of the State of _____, held on the _____ day of _____, 20____,
the following resolution was duly passed and adopted:

"RESOLVED, that _____
_____, (signature of individual) _____ (typed name of individual)
as _____ of the corporation, is hereby authorized to execute and all
documents required to be signed by an officer of the Corporation in order to submit a valid bid,
contract and bond for

CITY OF OCOEE
Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

between the CITY OF OCOEE, a municipal corporation, and this corporation, and that his
execution thereof, attested by the Secretary of the corporation and with corporate seal affixed shall
be the official act and deed of this corporation."

I FURTHER CERTIFY that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the
corporation this _____ day of _____, 202____.
(CORPORATE SEAL)

(Corporate Secretary)

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____, 20____
by _____
(name of officer or agent, title of officer or agent), by means of ☐ physical presence or ☐ online
notarization, of _____ (name of corporation acknowledging), a
_____ (state or place of incorporation) corporation, on behalf of the
corporation. He/She is personally known to me or has produced _____ (type
of identification) as identification and did/did not take an oath.

(Notary Public)
My Commission Expires: _____

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00300-12

**SECTION 00301
QUESTIONNAIRE**

Bidder shall fill out questionnaire form with all information pertinent to his/her company and the OCOEE WWTF Electrical Upgrade and Expansion.

DATE: _____

PROJECT IDENTIFICATION: CITY OF OCOEE
**ITB #24-008 OCOEE WWTF ELECTRICAL UPGRADE
AND EXPANSION - REBID**

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

TELEPHONE NO.: _____ EMAIL: _____

GENERAL CONTRACTOR'S LICENSE NO. (PROVIDE COPY): _____

SUNBIZ REGISTRATION NUMBER: _____

This questionnaire is intended to provide descriptive information about Bidder and to offer the opportunity for Bidder to demonstrate its compliance with the minimum requirements of this Invitation to Bid. **Minimum Requirements: Bidders must have the following experience in order to meet the minimum requirements of this Invitation to Bid: Prime Contractor on five (5) wastewater projects similar to the proposed Project and completed within the last ten (10) years, with at least three (3) of those projects being constructed in the last 5 years. Similar wastewater/water projects being either complete builds or electrical upgrades or a variation thereof.** The City reserves the right to disqualify a Bidder that does not provide this information within its Bid submission. The relevance and quality of prior experience necessary to identify a responsive Bidder shall solely be judged by the City of Ocoee at its discretion and is not reviewable through the bid protest process. Resumes of key project team members and their expected role in the project should be attached to this section and included in the Bid package submitted by the Bidder.

The undersigned warrants the truth and accuracy of all statements and answers herein contained. Include additional sheets if necessary.

1. How many years has your organization been in business?

2. REFERENCES/EXPERIENCE: List and provide information regarding the last five (5) projects you have completed in the last ten (10) years of similar in type, size, and nature as the one proposed, preferably with a governmental agency. Three of these projects must

have been completed in the past 5 years. Bidder must demonstrate the ability to perform services of similar complexity, nature, and size. For each project list the name of the project, contract performance dates, estimated total value of the contract, name and address of government agency or commercial agency, description of work performed, Bidder's role in the project, and special conditions present that had to be overcome, Bidder's project manager, the client's project manager, a reference person familiar with your work on the project, and contact information for that person. The relevant project may be removed from the list of references if the listed contact person refuses to provide information regarding your performance. Letters of Reference may also be provided. Only contracts for which Bidder was the prime contractor will be considered to be relevant. Attach additional sheets if necessary

Minimum Requirements: Bidders must have the following experience in order to meet the minimum requirements of this Invitation to Bid: Prime Contractor on five (5) wastewater projects similar to the proposed Project and completed within the last ten (10) years, with at least three (3) of those projects being constructed in the last 5 years. Similar wastewater/water projects being either complete builds or electrical upgrades or a variation thereof.

Name of Project: _____
Project Details: _____

Start date: _____ Completion date: _____
Contract amount: _____
Owner: _____
Owner's POC: Name and Title: _____
Phone number: _____
Email address: _____

Name of Project: _____
Project Details: _____

Start date: _____ Completion date: _____
Contract amount: _____
Owner: _____
Owner's POC: Name and Title: _____
Phone number: _____
Email address: _____

Name of Project: _____
Project Details: _____

Start date: _____ Completion date: _____
Contract amount: _____
Owner: _____
Owner's POC: Name and Title: _____
Phone number: _____
Email address: _____

Name of Project: _____
Project Details: _____

Start date: _____ Completion date: _____
Contract amount: _____
Owner: _____
Owner's POC: Name and Title: _____
Phone number: _____
Email address: _____

Name of Project: _____
Project Details: _____

Start date: _____ Completion date: _____
Contract amount: _____
Owner: _____
Owner's POC: Name and Title: _____
Phone number: _____
Email address: _____

3. Do you have any similar work in progress at this time? Yes ___ No ___.

4. Have you ever failed to complete work awarded to you? If so, where and why?

5. Name the proposed members of your project leadership team. For each person provide the name, title and years with the company. Attach the resume for all key personnel for this project.:

6. Name three (3) municipalities for which you have performed similar work and contact information:

7. Have you personally inspected the site of the proposed Work? _____
Describe any anticipated problems with the site and your proposed solutions.

8. What percentage of the Work to you intend to self-perform? _____

9. Will you Subcontract any part of the Work? If so, describe which portions by listing the name of the subcontractor, the part of the project they are to perform, and the percentage proportion of the Work represented by that activity. Confirm that no day labor shall be used unless approved by the City. If approved by the City, day labor may only be used for tidying the site.

10. What equipment do you plan on using to complete the Work?

11. State the true and exact, correct, and complete name under which you do business and give the company officer and the address of the office that will be responsible for the Work:

SECTION 00301-A

SUBCONTRACTOR & SUPPLIER LIST

Will your firm be doing all the Work with your own forces? Yes____ No____ (Check yes only if no subcontracting opportunities exist. If you will be doing portions of the Work with your own forces, list these areas and approximate dollar amount allocated for this Work. List suppliers).

List all proposed subcontractors and suppliers to be used to include company names, contractor license number, contact, addresses, phone numbers, type of work subcontracted (trade/commodity), and dollar amount of work. Provide all information requested. Use additional sheets if necessary.

Submit Update Subcontractor/Supplier List with each progress payment requested. Submit Final Subcontractor/Supplier List with Final Payment Request.

COMPANY NAME, CONTACT ADDRESS, PHONE NUMBER	WORK TO BE PERFORMED (TRADE) OR COMMODITY TO BE SUPPLIED	ESTIMATED DOLLAR AMOUNT
1		
2		
3		
4		
5		
6		
7		

END OF SECTION

SECTION 00302

COMPLIANCE WITH FLORIDA TRENCH SAFETY ACT (90-96, LAWS OF FLORIDA)

Bidder hereby acknowledges that all costs for complying with the Florida Trench Safety Act are included in the various items of the bid and in the Lump Sum Total Bid Price shown in Section 00300 - Bid Form, "Schedule of Bid Items". For informational purposes only, the bidder is required to further identify these costs in the summary below.

Trench Safety Measure (Description)		Unit of Measure (LF, SY)	Unit (Quantity)	Unit Cost	Extended Cost
A				\$	\$
B				\$	\$
C				\$	\$
D				\$	\$
				TOTAL	\$

BIDDER: _____

SIGNED: _____

BY: _____
(Print or type name)

TITLE: _____

DATE: _____

THIS IS NOT A PAY ITEM: The purpose of this form is to gather information on the costs associated with trench safety measures and to ensure Bidder has considered these costs and included them in the Lump Sum Total Bid price. Contractor will not receive additional payment if actual quantities differ from those estimated or if the Contractor uses a safety measure different than those listed.

(Failure to complete this Form may result in the Bid being declared non-responsive.)

END OF SECTION

SECTION 00303

DRUG-FREE WORKPLACE CERTIFICATION

IDENTICAL TIE BIDS: Preference shall be given to businesses with drug-free workplace programs. In accordance with Florida Statute 287.087, whenever two or more bids that are equal with respect to price, quantity, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a bid from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, and available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or *nolo contendere* to, any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program is such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Bidder: _____

Signed: _____

By: _____
(Print or Type Name)

Title: _____

Date: _____

END OF SECTION

SECTION 00310

CONTRACTOR E-VERIFY AFFIDAVIT

I hereby certify that _____ [contractor] does not employ, contract with, or subcontract with an unauthorized alien, and is otherwise in full compliance with Section 448.095, Florida Statutes.

All employees hired on or after January 1, 2021 have had their work authorization status verified through the E-Verify system.

A true and correct copy of _____ [contractor] proof of registration in the E-Verify system is attached to this Affidavit.

Print Name: _____

Date: _____

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐physical presence or ☐online notarization, this _____ (date) by _____ (name of officer or agent, title of officer or agent) of _____ (name of contractor company acknowledging), a _____ (state or place of incorporation) corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ (type of identification) as identification.

[Notary Seal]

Notary Public

Name typed, printed or stamped

My Commission Expires: _____

SECTION 00311

SAM.GOV REGISTRATION INFORMATION

In accordance with applicable federal requirements, the City of Ocoee will verify all bidders on SAM.gov (System for Award Management) for federal debarment or suspension exclusions as a responsibility determination. The City of Ocoee requires the successful Bidder to register with Sam.gov, if not already registered, prior to execution of this contract.

Contractor: _____

Unique Entity ID (UEI) number: _____

CAGE Code: _____

Physical Address: _____

Expiration date of Registration: _____

SECTION 00312

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

The undersigned, [Company]_____certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Contractor, [Company]_____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 *et seq.*, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

END OF SECTION

SECTION 00313

CONFIDENTIAL DISCLOSURE AGREEMENT

This Agreement is entered into by and between _____
(hereinafter "Recipient") and the City of Ocoee (hereinafter "City").

RECITALS

WHEREAS, City needs to disseminate certain building plans, blueprints, specifications, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a water treatment facility ("design information"), in order for it to be designed and constructed pursuant to **ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid** (the Project); and

WHEREAS, such design information is exempt from public records disclosure requirements of Florida Statutes Section 119.07(1) and s. 24(a), Art. I of the Florida State Constitution. This exemption provides that design information made exempt by law may be disclosed to another governmental entity if disclosure is necessary for the receiving entity to perform its duties and responsibilities; to a licensed architect, engineer, or contractor who is performing work on or related to a public building or water treatment facility; and that the entities or persons receiving such information shall maintain the exempt status; and

WHEREAS, Recipient is willing to receive disclosure of the design information pursuant to the terms of this Agreement for the purpose of bidding on the project and/or performing design services;

NOW THEREFORE, for good and sufficient consideration Recipient agrees as follows:

1. The above Recitals are acknowledged by Recipient and are incorporated herein by reference.
2. Recipient agrees that it shall prevent and protect the design information, or any part thereof, from disclosure as a public record and shall not disclose the design information to

any person or entity other than one having a need for disclosure in connection with Recipient's authorized use of the design information for the purposes of submitting a response to the bid solicitation.

3. Recipient agrees to take all steps reasonably necessary to protect the secrecy of the design information, and to require all entities or persons receiving the design information to maintain its exempt status and to prevent the design information from being disclosed as a public record or coming into the possession of a person or entity that is not authorized.

4. Recipient agrees that all design information shall remain the property of City. All design information and all copies thereof shall be returned to City not later than thirty (30) days after the bid opening together with a list of all of the names and addresses of all entities or persons to which the design information has been disclosed; or, in the case of a designer, not later than thirty (30) days after the project is finally completed.

Dated this _____ day of _____, 20__ .

RECIPIENT

Signed: _____

Print Name: _____

Title: _____

Company: _____

Address: _____

Phone No: _____

Date: _____

SECTION 00314

**ANSWERS TO QUESTIONS RECEIVED AND/OR
AMENDMENTS TO THE BIDDING DOCUMENTS**

Bidder must complete and submit this form with Bid. By signing below, Bidder acknowledges Bidder has examined the answers to questions received and/or amendments to the Bidding Documents contained within this document.

1. **The PICS Supplier referenced in Section 13600 1.03A(1)(i) is amended to Telemetry Process Controls, Oakdale, MN, (651) 430-0435.**
- Q1. Who installs the VFDs? Section 1.03A and 2.01A4 state differences on who installs the VFDs.
- A1. **The VFDs are supplied by Telemetry Process Controls as stated as an allowance in Bid Item 4.2. Contractor is responsible for the installation and wiring of the VFDs. Start-up and testing are provided by TPC.**
- Q2. Typo of VFD Quantity: Not MCC1 and MCC2, SB-1 and SB-2? What is the correct quantity of VFDs?
- A2. **There are eight (8) VFDs, two (2) for the blowers and six (6) for the rotors.**
- Q3. Can you confirm if the new blower piping is to be Ductile Iron like the existing? Any Lining requirements?
- A3. **Yes, the new blower piping will be ductile iron. Bare interior pipe, no liner.**
- Q4. This project states through ARPA/SLFRF funding that it has Davis Bacon Wage Requirements. Upon further review, it says in the Division 0 documents that the wages only apply to contracts exceeding \$10 million. Can you clarify?
- A4. **Since the funding is from the ARPA grant, the Davis Bacon requirements would only apply if the contract amount is over \$10 million as the Treasury waived the Davis Bacon requirements for contracts under that amount.**
- Q5. I work on bids at Hach. I came across Ocoee WWTF Electrical Upgrade and Expansion. It states for the digital indicator that the manufacturer is Newport Electronics, Precision Digital or approved equal. Would Hach be considered an approved equal?
- A5. **Bid per the specifications and the Bid Documents. If the contractor wants to substitute during construction, they send a request to the engineer who answers the question. See also Article 10 of the Instructions to Bidders - Substitute Material and Equipment.**

Q6. I would like to propose Yaskawa as an acceptable manufacturer for the VFD portion of this job. Section 16370:1.02.E -Add Yaskawa America Inc.

A6. Bid per the specifications and the Bid Documents. See also Article 10 of the Instructions to Bidders - Substitute Material and Equipment. If the contractor wants to substitute during construction, they send a request to the engineer who answers the question. Additionally, the City's standard VFD is manufactured by Danfoss. Refer to Section 16370, 1.02 E – Approved Manufacturer.

BIDDER: _____

SIGNED: _____

BY: _____
(Print or type name)

TITLE: _____

DATE: _____

END OF SECTION

SECTION 00410

BID BOND

Bidder shall provide the City with a Bid Bond in the amount of five percent (5%) of the contract bid.

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____, as Principal, and _____
_____ as Surety, are hereby held and firmly bound unto the City of Ocoee,
Florida, as Owner, in the penal sum of, (5 percent of the Contract Bid) \$ _____

(written amount in dollars and cents)

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 20____. The Condition of the above obligation is such that whereas the Principal has submitted to the City of Ocoee, Florida a certain Bid, attached hereto and hereby made a part hereof to enter into a contract in writing, for the Project: "ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid".

NOW THEREFORE

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder any damages, costs, or expenses, including attorney's fees, incurred by Owner that are proximately caused by such default. In no event shall Bidder's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents,

or

- 3.2 All bids are rejected by Owner, or
- 3.3 Owner fails to issue a Notice of Intent to Award to Bidder within ninety (90) days from the time and date fixed for the opening of Bids (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the total time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from Bid Due Date without Surety's written consent.
6. No suit or action shall be commenced under this bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid Due Date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond, a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "bid" as used herein includes a bid, offer, or proposal as applicable.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

BIDDER:	Strike out (X) non-applicable signature blocks and complete applicable block. All signatures must have their names printed or type below their signature.
---------	--

If Bidder is SOLE PROPRIETORSHIP , complete this signature block.	
(Individual's Signature) (Individual's Signature) doing business as (Business Address) (Telephone No.) (Florida License No.)	(1) (Witness) (2) (Witness) (SEAL)

If Bidder is PARTNERSHIP , complete this signature block.	
_____	(1) _____
(Partnership Name)	(Witness)
_____	(2) _____
(General Partner's Signature)	(Witness)
_____	(SEAL)
(General Partner's Name)	

(Business Address)	

(Telephone No.)	(Florida License No.)

If Bidder is CORPORATION , complete this signature block.	
_____	(1) _____
(Corporation Name)	(Witness)
_____	(2) _____
(State of Incorporation)	(Witness)
By: _____	
(Name of Person Authorized to Sign - See Note 1)	
_____	(SEAL)
(Title)	

(Authorized Signature)	

(Corporation President)	

(Business Address)	

(Telephone No.) (Florida License No.)	

SURETY

(Surety Business Name) (Principal Place of Business) By: _____ (Surety Agent's Signature - See Note 2) (Surety Agent's Name) (Surety Agent's Title) (Business Name of Local Agent for Surety) (Business Address) (Telephone No.) (Bond No.)	Witness: (If agency is not a Corporation) (1) _____ (Witness) (2) _____ (Witness) Attest: (If Agency is a Corporation) (Corporate Secretary Signature) (Corporate Secretary Name) (Corporate Seal)
---	---

NOTES:

- (1) Complete and attach "Corporate Authority to Execute Documents" if executed by any corporate employee other than president or vice-president.
- (2) Complete and attach a certified copy of "Power-of-Attorney" prepared by Surety appointing individual "Attorney-in-Fact" for execution of Bid Bond on behalf of Surety and corresponding notarized "Attorney-in-Fact".
- (3) Above addresses are to be used for giving required notice.
- (4) Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.
- (5) Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

ATTORNEY-IN-FACT AFFIDAVIT

STATE OR COMMONWEALTH OF _____)

COUNTY OR CITY OF _____)

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this ____ day of _____, 20__ by _____ as Attorney-in-Fact, who is personally known to me or who has produced _____ as identification on behalf of _____, a _____ Corporation,

(Surety Company) (State)

which executed the attached bond as surety, who deposed and said that his signature and the corporate seal of said _____ were affixed by order and authority of said

(Surety Company)

Company's Board of Directors, and that the execution of the attached bond is the free act and deed of

(Surety Company)

Given under my hand and seal this _____ day of _____, 202__.

(Notary Public)

My Commission Expires _____

END OF SECTION

SECTION 00480

NON-COLLUSION AFFIDAVIT

STATE OF _____
COUNTY OF _____

_____, being first duly sworn deposes and says:

1. He/She is the _____
(Owner, Partner, Office, Representative or Agent)
of _____, the Bidder that has
submitted the attached Bid;
2. He/She is fully informed respecting the preparation and contents of the attached Bid and
of all pertinent circumstances respecting such Bid;
3. Such Bid is genuine and is not a collusive or sham Bid;
4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives,
employees, or parties in interest, including this affidavit, have in any way, colluded,
conspired, connived or agreed, directly or indirectly, with any other Bidder, firm or
person to submit a collusive or sham Bid in connection with the Contract for which the
attached Bid has been submitted; or to refrain from bidding in connection with such
Contract; or have in any manner, directly or indirectly, sought by agreement or collusion,
or communication, or conference with any Bidder, firm, or person to fix the price or
prices in the attached Bid or of any other Bidder, or to fix any overhead, profit, or cost
elements of the Bid price or the Bid price in any other Bidder, or to secure through any
collusion, conspiracy, connivance, or unlawful agreement any advantage against
(Recipient), or any person interested in the proposed Contract;
5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by
any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or
any other of its agents, representatives, owners, employees or parties in interest, including
this affidavit.

By: _____
Title: _____

Sworn to and subscribed before me by means of ☐ physical presence or ☐ online notarization,
this ____ day of _____, 202__, by _____ in the state of
_____ County of _____.

Notary Public
My Commission Expires: _____

END OF SECTION



BID CONFLICT OF INTEREST DISCLOSURE FORM

Award of this contract is subject to the provisions of Chapter 112, Florida Statutes. All Bidders must disclose within their Bid: the name of any City of Ocoee employee, Mayor or City Commissioner, other City Official, or City Consultants, who owns assets or capital stock, directly or indirectly, in the Bidder's firm or any of its branches, or would directly or indirectly benefit by the profits or emoluments of this Bid. (Indirect ownership or benefit applies to any members of his or her immediate family.) Bidder certifies that no member of the entity's ownership or management is presently applying for an employee position or actively seeking an elected position with the City. In the event that a conflict of interest is identified in the provision of services, Bidder agrees to immediately notify the City in writing.

The purpose of this disclosure form is to give the City the information needed to identify potential conflicts of interest for the City Commission, Staff, and other key City employees and consultants involved in the award and administration of this contract.

According to Chapter 112, Florida Statutes, the term "conflict of interest" "means a situation in which regard for a private interest tends to lead to disregard of a public duty or interest", and refers to situations in which financial or other personal considerations may adversely affect, or have the appearance of adversely affecting, an employee's professional judgment in exercising any City duty or responsibility in administration, management, instruction, research, or other professional activities.

Please check one of the following statements and attach additional documentation if necessary:

_____ To the best of our knowledge, the undersigned firm has no potential conflict of interest for this Bid.

_____ The undersigned firm, by attachment to this form, submits information which may be a potential conflict of interest for this Bid.

Acknowledged by:

Firm Name

Signature

Name and Title (Print or Type)

Date

SECTION 00481

CERTIFICATION OF NONSEGREGATED FACILITIES

Bidder certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under this control, where segregated facilities are maintained. The Bidder certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The Bidder agrees that a breach of this certification will be a violation of the Equal Opportunity clause in any contract resulting from acceptance of this Bid. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage and dressing areas, parking lots, drinking fountains, recreation or entertainment area, transportation, and housing facilities provided for employees on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. Bidder agrees that (except where he has obtained identical certification from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

The nondiscriminatory guidelines as promulgated in Section 202, Executive Order 11246, and as amended by Executive Order 11375 and as amended, relative to Equal Opportunity for all persons and implementations of rules and regulations prescribed by the United States Secretary of Labor are incorporated herein.

Note:

The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date _____, 20____.

By: _____

(Title)

Official Address (including Zip Code):

ATTACH AND INCLUDE AS PART OF BID FORM; FAILURE TO DO SO MAY BE CAUSE FOR DISQUALIFICATION OF YOUR BID.

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00481-1

SECTION 00482

SWORN STATEMENT UNDER SECTION 287.133(3)(a),
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. 1. This sworn statement is submitted to City of Ocoee, Florida by _____
(Entity)
by _____
(Print individual's Name & Title)

whose business address is _____

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material representation.
3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
- a. A predecessor or successor of a person convicted of a public entity crime: or
 - b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a *prima facie* case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.
6. Based on information and belief, the statement I have marked below is true in relation to the entity submitting this sworn statement. (please indicate which statement applies).

_____ Neither the entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of this entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of this entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding concerning the conviction before a Hearing Officer of the State of Florida, Division of Administrative Hearings. The final order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (Please attach a copy of the final order.)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY, AND THAT THIS FORM IS VALID FOR A PERIOD OF ONE YEAR. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES, FOR CATEGORY TWO OF CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

(Signature)

Date: _____

Name of Bidder (Contractor)

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

STATE OF _____

COUNTY OF _____

Sworn to (or affirmed) and subscribed before me by means of ☐ physical presence or ☐ online notarization, this _____ day of _____, 20____ by _____ affixed his/her signature in the place provided above on this _____ day of _____, 20____.

Notary Public _____

My Commission Expires: _____

END OF SECTION

SECTION 00483

CERTIFICATION OF NONDISCRIMINATORY LABOR PRACTICES

This certification relates to a construction contract proposed by the City of Ocoee for ITB #24-008.

Equal Opportunity Employment: The Contractor shall not discriminate on the basis of race, color, national origin, gender, age, handicapped status, veteran status, and/or religion in performing the work governed by this contract. The City is an Equal Opportunity Employer (EOE) and as such encourages all contractors to comply with EOE regulations. Any subcontract the Contractor may enter into shall include this clause with the same degree of application being encouraged.

I am the undersigned prospective construction contractor or subcontractor. I certify that:

- (1) I have _____ I have not _____ participated in a previous contract or subcontract subject to the Equal Opportunity Clause and
- (2) if I have participated in a previous contract or subcontract subject to the Equal Opportunity Clause, I have _____ I have not _____ filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs, or the Equal Employment Opportunity Commission all reports due under the applicable filing requirements.

I understand that, if I have participated in a previous contract or subcontract subject to the Equal Opportunity Clause and have failed to file all reports due under the applicable filing requirements, I am not eligible, and will not be eligible, to have my bid or offer considered, or to enter into the proposed contract or subcontract, unless and until I make an arrangement regarding such reports that is satisfactory to the office where the reports are required to be filed.

I agree that I will obtain identical certifications from prospective lower-tier sub-contractors when I receive bids or offers or initiate negotiations for any lower-tier construction subcontracts with a price exceeding \$10,000. I also agree that I will retain such certifications in my files.

Date _____, 20____.

By: _____
(Signature of Authorized Official)

(Name of Construction Contractor or Subcontractor)

(Address of Construction Contractor or Subcontractor)

(Telephone Number)

(Employer Identification No.)

END OF SECTION

SECTION 00484

CERTIFICATION REGARDING SCRUTINIZED COMPANIES' LISTS

Bidder certifies that the company is not participating in a boycott of Israel. Bidder certifies that Bidder is not on the Scrutinized Companies that Boycott Israel List, not on the Scrutinized Companies with Activities in Sudan List, not on the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, and is not engaged in business operations in Cuba or Syria, as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that Bidder is unable to provide such certification but still seeks to be considered for award of this solicitation, Bidder shall, on a separate piece of paper, clearly state that it is on one or both of the Scrutinized Companies lists and shall furnish together with its proposal a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. Bidder agrees to cooperate fully with the City in any investigation undertaken by the City to determine whether the claimed exception would be applicable. City shall have the right to terminate any contract resulting from this solicitation for default if Bidder is found to have submitted a false certification, or to have been placed on the Scrutinized Companies that Boycott Israel List, or to have been placed on the Scrutinized Companies for Activities in Sudan List, or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria.

Bidder: _____

By: _____
(Authorized Signature)

Printed Name and Title: _____

Date: _____

END OF SECTION

SECTION 00500
PROPOSED CONTRACT FOR CONSTRUCTION

THIS AGREEMENT is dated as of the _____ day of _____ in the year _____ by and between the City of Ocoee, a municipal corporation, hereinafter called Owner, and _____, hereinafter called Contractor.

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The work is generally described as follows:

**Ocoee WWTF Electrical Upgrade and Expansion
ITB #24-008**

General Scope of Work:

- A. The project will consist of, but is not limited to, the following:
 - i. Construct one (1) Electrical Building and furnish and install new electrical equipment
 - ii. Install new 1000 KW generator with weatherproof sound-attenuating walk-in type enclosure and belly tank (generator, automatic transfer switches, and fuel monitoring system to be provided by the City)
 - iii. Construct blower pad and install new blowers (blowers to be provided by the City)
 - iv. Demolish existing generator, diesel fuel tank, transformer, sidewalk and aboveground blower piping
 - v. Furnish and install electrical conduit and electrical pullboxes.
 - vi. Construct generator pad, grade site and install new concrete sidewalks.
 - vii. Construct transformer pad per Duke Energy Specifications
 - viii. Remove existing asphalt pavement and replace with concrete pavement. Patch all removed asphalt pavement (not covered by concrete) with full-depth asphalt.
- B. Furnish all materials, equipment, tools, and labor which is reasonably and properly inferable and necessary for the proper completion of the Work, whether specifically indicated in the Contract Documents or not.
- C. All permits, licenses and fees, other than those permits included in the appendices shall be secured and paid for by the CONTRACTOR.
- D. Repair, replace, or otherwise settle with the Owner, if damage to property or existing facilities occurs, including damage to pavements, utilities, lawns, structures, etc.
- E. Construct the Project under a single lump sum contract.

All work is to be conducted and in accordance with the specifications within the Bidding Documents

ARTICLE 2. ENGINEER

The Project has been designed by CPH, LLC and the City of Ocoee Utilities Department; however, the City Utilities Director (within here and other references in the contract documents as “Engineer”) or designee is to act as Owner's representative, assume all duties and responsibilities of the project engineer, and have the rights and authority assigned Director in the Contract Documents in connection with completion of the Work.

ARTICLE 3. CONTRACT TIME

- 3.1 The work shall be substantially complete within **Three Hundred Ninety (390) calendar days**. The entire work shall be complete and ready for its intended use, including final dressing and cleanup, within **Four Hundred Fifty (450) calendar days**. All time periods begin from the effective date of the Notice to Proceed, as provided in paragraph 2.03 of the General Conditions (Commencement of Contract Time; Notice to Proceed).

In accordance with Florida Statutes Section §218.735, within 30 calendar days, or 45 days if over \$10 million construction cost, of reaching substantial completion of the construction services, the Owner and Contractor shall work together to develop the single list of items and the estimated cost to complete each item on the list required to render complete, satisfactory, and acceptable the construction services purchased by the Owner. See also General Conditions Section 710, and Section 5 of the Contract, Payment Procedures.

- 3.2 Placing of permanent pavement markings on all final asphaltic concrete surfaces, if applicable, shall not be accomplished before thirty (30) calendar days have elapsed after placement of the final surfaces. The charging of Contract Time will be suspended during the thirty (30) calendar-day period provided the work is considered to be Substantially Complete, as provided in paragraph 3.1 above. The charging of Contract Time will resume on the 31st day.
- 3.3 Contractor recognizes that time is of the essence of this Agreement and that Owner will suffer financial loss if the work is not completed within the times as specified, plus any extensions thereof allowed in accordance with the General and Supplementary Conditions. Contractor acknowledges that proving the actual loss and damages suffered by Owner if the work is not completed on time is impracticable and not susceptible to exact calculation. Accordingly, instead of requiring any such proof, Contractor agrees that as liquidated damages for delay (but not as a penalty) Contractor shall pay to Owner for work not completed as specified paragraph 3.1 the following:

Substantial Completion: Two Hundred Dollars (\$200.00) for each day

Final Completion: Two Hundred and Fifty Dollars (\$250.00) for each day

Note: Each Day(s) in this section shall be referred to as calendar day(s)

- 3.4 In addition to the liquidated damages, there shall be additional incidental damages paid by Contractor to the Owner for failure to timely complete the work. These may include, but

not be limited to, delay damage settlements or awards owed by Owner to others, inspection and engineering services, interest and bond expense, delay penalties, fines or penalties imposed by regulatory agencies, contract damages, and professional fees (including attorneys' fees) incurred by Owner in connection with Contractor's failure to timely complete the work.

- 3.5 In addition to liquidated damages and incidental damages arising from Contractor's failure to perform the work, Contractor may be required to repay Owner for the cost of corrective actions undertaken by Owner to resolve construction defects. Such corrective actions include, but are not limited to, restoration of damaged areas, clearing of reclaimed water customer facilities to remove construction debris, repair and replacement of damaged reclaimed water customer equipment, and emergency repairs to the reclaimed water distribution system during the one-year warranty period.
- 3.6 Suspension of Work and Termination as stated in Article 15 of the General Conditions.

ARTICLE 4. CONTRACT PRICE

- 4.1 Owner shall pay Contractor for performance of the work in accordance with the Contract Documents in current funds at the lump sum or unit prices presented in the Bid Form (Contract Total Bid Amount):

_____,
DOLLARS AND ____ CENTS, (\$ _____), which is incorporated herein and made a part hereof by this reference.

- 4.2 Contractor agrees that the Contract Price is a stipulated sum except with regard to those items in the bid which are subject to unit prices and agrees to perform all of the work as described in the Contract Documents, subject to additions and deductions by Change Order, and comply with the terms therein for the Bid stated in the attached Bid Form.

ARTICLE 5. PAYMENT PROCEDURES

Contractor shall submit applications for payment in accordance with Article 14 of the General Conditions. Applications for payment will be processed by Engineer, as provided in the General Conditions.

- 5.1 Progress Payments. In accordance with Section §218.735 Florida Statutes, Owner shall make progress payments on account of the Contract Price on the basis of Contractor's properly submitted and approved Applications for Payment, as recommended by Engineer, not later than the Twenty-fifth (25th) business day after the date on which the properly submitted Application for Payment is initially received by Owner. All such progress payments will be on the basis of the progress of the work measured by the Schedule of Values established in paragraph 2.07 of the General Conditions (Initial Acceptance of Schedules) (and in the case of Unit Price, work based on the number of units completed) and included in Contractor's qualifications submittals.

- 5.1.1 Contractor shall submit monthly applications for payment on the City-provided forms.
- 5.1.2 Progress payments shall be equal to ninety-five percent (95%) of the value of work completed to date and Ongoing Stored Material Allowance as defined in Section 01025 Measurement and Payment, to include materials and equipment not incorporated into the work but delivered and suitably stored and accompanied by documentation satisfactory to Owner, with the remaining five percent 5% of the work being retainage.
- 5.1.3 Retainage shall be five (5) percent of work to date based on the progress payment, including all change orders,
- 5.2 Final Payment - Within 20 business days after the list is created, upon receipt of a proper invoice or Application for Payment, the Owner shall pay the contractor the remaining contract balance that includes all retainage previously withheld by the Owner less an amount equal to 150 percent of the estimated cost to complete the items on the list, less any liquidated damages. Upon completion of all items on the list, the contractor may submit a payment request for the amount withheld by the Owner. If a good faith dispute exists as to whether one or more items identified on the list have been completed pursuant to the contract, the local governmental entity may continue to withhold up to 150 percent of the total costs to complete such items. If the Owner has provided written notice to the contractor specifying the failure of the contractor to meet contract requirements in the development of the list of items to be completed, the Owner must pay the contractor the remaining balance of the contract, less any items in dispute, less an amount equal to 150 percent of the estimated cost to complete the items that the local governmental entity intended to include on the list.

ARTICLE 6. INTEREST

All monies not paid when due shall bear interest at the rate set in accordance with Chapter 218, Part VII, the Local Government Payment Act.

ARTICLE 7. CONTRACTOR'S REPRESENTATIONS

In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

- 7.1 Contractor has examined and carefully studied the Contract Documents (including the Addenda listed in paragraph 8) and the other related data identified in the Bidding Documents including "technical data."
- 7.2 Contractor has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishings of the work.
- 7.3 Contractor is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, performance, and furnishing of the work.

- 7.4 Contractor has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) that are identified in Section 00200 "Information Available to Bidders".
- 7.5 Contractor has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect costs, progress, performance or furnishing of the work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.
- 7.6 Contractor is aware of the general nature of work to be performed by Owner and others at the site that relates to the work as indicated in the Contract Documents.
- 7.7 Contractor has correlated the information known to Contractor, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- 7.8 Contractor has given Engineer written notice of all conflicts, errors, ambiguities or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Contractor, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the work.
- 7.9 **Warranty.** Contractor warrants that the Work including equipment and materials provided shall conform to professional standards of care and practice in effect at the time the Work is performed; be free from all faults, defects or errors; and be of the highest quality. If Contractor is notified in writing of a fault, deficiency or error in the Work provided within one (1) year from expiration date of this Agreement except in those instances where extended Warranties are specified (the longer period will govern), Contractor shall, at City's option, either redo such portions of the Work to correct such fault, defect or error, at no additional cost to City; or refund to City the amount paid by City which is attributable to such portions of the faulty, defective or erroneous Work, including the costs for obtaining another Contractor to redo the Work.
- ALL MATERIALS AND SERVICES PROVIDED BY CONTRACTOR, SHALL BE MERCHANTABLE AND FIT FOR THE PURPOSES INTENDED.**

CONTRACTOR SHALL BE LIABLE FOR SECONDARY, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE RESULTING FROM ANY WORK PERFORMED UNDER THIS AGREEMENT.

ARTICLE 8. CONTRACT DOCUMENTS

The Contract Documents, which comprise the entire agreement between Owner and Contractor concerning the work, are attached to this Agreement, made a part hereof, and consist of the following:

- 8.1 This Scope of work Agreement (Section 00500).
- 8.2 Exhibits to this Scope of work Agreement (if any).
- 8.3 Performance Bond, Payment Bonds and Certificates of Insurance (Sections 00610, 00620 and 00650, respectively).
- 8.4 Notice of Award and Notice to Proceed.
- 8.5 General Conditions (Section 00710 - NSPE - ACEC Document 1910-8 (1996 Edition), as modified and supplemented.
- 8.6 Supplementary Conditions (Section 00800) (If Applicable).
- 8.7 Specific Technical Specifications.
- 8.9 Project Manual bearing the general title "**City of Ocoee, Florida, Ocoee WWTF Electrical Upgrade and Expansion – Rebid ITB #24-008**" consisting of Divisions 0 through 3 and Appendix A through C, as listed in the Table of Contents thereof, including the Invitation to Bid (Section 00020) and Instructions to Bidders (Section 00100).
- 8.10 Drawings consisting of a cover sheet and the sheets bearing the following general title:

**City of Ocoee
Ocoee WWTF Electrical Upgrade and Expansion**

- 8.11 Addenda numbers ___ to ___, inclusive.
- 8.12 Contractor's Bid (Section 00300) including all required forms.
- 8.13 Documentation submitted by Contractor prior to Notice of Intent to Award.

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified, or supplemented, as provided in paragraphs 3.04 of the General Conditions.

ARTICLE 9. TERMINATION

- 9.1 **Termination for Cause.** If Contractor fails or neglects to perform a material obligation under this Agreement the City shall provide written notice to the Contractor that the Contractor is in default and that City intends to terminate this Agreement if the default(s)

are not cured. If the Contractor fails to cure the default(s) or, if such default(s) cannot practicably be cured within five (5) days and Contractor fails to diligently commence to correct the default(s), then the City may, without prejudice to any other remedy, cure such default(s) and/or rectify such deficiencies and charge the Contractor the reasonable cost thereof; or, at the City's option, may terminate this Agreement. In the event of such termination for cause the Contractor shall turn over to the City all documents, materials, plans, specifications, manuals, records, submittals, correspondence, minutes, memoranda, tape recordings, videos, or other things or electronic data that relate to or concern the work performed by the Contractor under this Agreement. If it is later determined that the City's termination for cause under this Agreement was improper or not justified, then the parties agree that the termination of the Contractor shall be deemed and treated as a termination for convenience and, the Contractor's sole and exclusive remedy shall be to receive compensation in the same manner as prescribed for a termination for convenience.

- 9.2 **Termination for Convenience.** The City may terminate this Agreement at any time solely for its convenience by providing the Contractor with thirty (30) days written notice. In the event of such a termination by the City for convenience, the City shall be shall pay for all Work properly performed prior to the effective date of the termination and for all materials, supplies and services, which were reasonably utilized to perform the Work through the effective date of the termination for convenience and other normal and reasonable costs incurred by the Contractor that are caused by or reasonably arise out of the termination for convenience.

ARTICLE 10. FEDERAL REQUIREMENTS

- 10.1 All procurements by Federal Grant recipients and sub-recipients shall comply with the provisions of 2 C.F.R. Section 200.317 – 327. All procurement transactions shall be conducted in a manner providing full and open competition consistent with the standards of 2 C.F.R. Section 200.317 – 327.
- 10.2 The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the City, Contractor, or any other party pertaining to any matter resulting from this contract. In the event of a conflict between the City's Purchasing Policy, codified at Chapter 21 of the City's Code of Ordinances, and Federal Code, the more restrictive rule shall prevail.
- 10.3 Proper documentation is required by the American Rescue Plan Act, per the federal requirements and corresponding forms.
- 10.4 **Media Interaction** - The contractor, including all sub-contractors, will not provide any information to the media without the expressed written permission of the City's Utilities Director. This includes on site interviews requested from any media outlet. All inquiries by a member of the media or any elected official will be directed to the City's Utilities Director. The Contractor will ensure this guidance is disseminated to all employees and sub-contractors on the project.

- 10.5 Federal Seal, Logo and Flags - The contractor shall not use the Federal agency's seal(s), logos, crests, or reproductions of flags or likenesses of Federal agency officials without specific Federal pre-approval.
- 10.6 Contractor shall comply with the Energy Policy and Conservation Act (42 U.S.C. section 6201). Mandatory standards and policies relating to energy efficiency, contained in any applicable State Energy Conservation Plan, shall be utilized.
- 10.7 RETENTION OF RECORDS FOR ARPA PROJECTS. The U. S. Department of Treasury requires records to be maintained for a period of five years for the ARP/CSLFRF award. Contractor shall retain all records for ARPA projects and make available upon request for a period of five (5) years following final payment to the contractor.
- 10.8 2 C.F.R Appendix II to Part 200 - Contract Provisions for Non-Federal Entity Contracts Under Federal Awards:

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

(A) Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by [41 U.S.C. 1908](#), must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

(B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be affected and the basis for settlement.

(C) Equal Employment Opportunity. Except as otherwise provided under [41 CFR Part 60](#), all contracts that meet the definition of "federally assisted construction contract" in [41 CFR Part 60-1.3](#) must include the equal opportunity clause provided under [41 CFR 60-1.4\(b\)](#), in accordance with Executive Order 11246, "Equal Employment Opportunity" ([30 FR 12319](#), [12935](#), [3 CFR Part, 1964-1965](#) Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at [41 CFR part 60](#), "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

*(D) Davis-Bacon Act, as amended ([40 U.S.C. 3141-3148](#)). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act ([40 U.S.C. 3141-3144](#), and [3146-3148](#)) as supplemented by Department of Labor regulations ([29 CFR Part 5](#), "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award

a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland “Anti-Kickback” Act ([40 U.S.C. 3145](#)), as supplemented by Department of Labor regulations ([29 CFR Part 3](#), “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

*See notes on the last page of this section regarding the application of the Davis-Bacon Act for ARPA funded projects.

(E) Contract Work Hours and Safety Standards Act ([40 U.S.C. 3701-3708](#)). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with [40 U.S.C. 3702](#) and [3704](#), as supplemented by Department of Labor regulations ([29 CFR Part 5](#)). Under [40 U.S.C. 3702](#) of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of [40 U.S.C. 3704](#) are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of “funding agreement” under [37 CFR § 401.2 \(a\)](#) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the recipient or subrecipient must comply with the requirements of [37 CFR Part 401](#), “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.

(G) Clean Air Act ([42 U.S.C. 7401-7671q.](#)) and the Federal Water Pollution Control Act ([33 U.S.C. 1251-1387](#)), as amended - Contracts and subgrants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act ([42 U.S.C. 7401-7671q](#)) and the Federal Water Pollution Control Act as amended ([33 U.S.C. 1251-1387](#)). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Debarment and Suspension (Executive Orders 12549 and 12689) - A contract award (see [2 CFR 180.220](#)) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at [2 CFR 180](#) that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties

debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(I) Byrd Anti-Lobbying Amendment ([31 U.S.C. 1352](#)) - Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by [31 U.S.C. 1352](#). Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(J) [§ 200.323](#). Procurement of recovered materials - A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at [40 CFR part 247](#) that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

(K) [§ 200.216](#). Prohibition on certain telecommunications and video surveillance services or equipment

(a) Recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

- (1) Procure or obtain;
- (2) Extend or renew a contract to procure or obtain; or
- (3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in [Public Law 115-232](#), section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
 - (i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
 - (ii) Telecommunications or video surveillance services provided by such entities or using such equipment.
 - (iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

- (b) In implementing the prohibition under [Public Law 115-232](#), section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.
- (c) See [Public Law 115-232](#), section 889 for additional information.
- (d) See also [§ 200.471](#).
- (L) [§ 200.322](#). Domestic preferences for procurements –
 - (a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.
 - (b) For purposes of this section:
 - (1) “Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
 - (2) “Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

[[78 FR 78608](#), Dec. 26, 2013, as amended at [79 FR 75888](#), Dec. 19, 2014; [85 FR 49577](#), Aug. 13, 2020]

End of 2 C.F.R. Appendix II to Part 200

*NOTE: For federal grant funded ARPA projects, the Davis-Bacon Act applies to infrastructure projects over \$10 million. Additionally, recipients may be otherwise subject to the requirements of the Davis-Bacon Act, when CSFRF/CLFRF award funds are used on a construction project in conjunction with funds from another federal program that requires enforcement of the Davis-Bacon Act.

Wage Determinations can be located at <https://sam.gov/content/wage-determinations>.

ARTICLE 11. MISCELLANEOUS

- 11.1 Terms used in this Agreement that are defined in Article 1 (Definitions) of the General Conditions shall have the meanings indicated in the General Conditions, as may be modified in the Supplementary Conditions.
- 11.2 No assignment by a party hereto of any rights under, or interests in, the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically, but without limitation, moneys that may become due, and moneys that are due, may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or

discharge the assignor from any duty or responsibility under the Contract Documents. Notwithstanding the foregoing, the Owner may assign this contract to the State of Florida or any political subdivision, municipality, special district or authority thereof without Contractor's consent and without recourse.

- 11.3 Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto, his partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.
- 11.4 Chapter 558, Florida Statutes: The parties agree that the provisions of Chapter 558, Florida Statutes are not applicable to this Agreement.
- 11.5 Waiver of Jury Trial; Legal Costs. It is mutually agreed by and between the Contractor and Owner that each of the parties do hereby waive trial by jury in any action, proceeding or claim which may be brought by either of the parties hereto against the other on any matters concerning or arising out of this Agreement. The parties further agree that the sole and exclusive venue for any action to enforce this agreement shall be in The Circuit Court of the Ninth Judicial Circuit in and for Orange County, Florida.
- 11.6 SCRUTINIZED COMPANIES: The Respondent certifies that the company is not participating in a boycott of Israel. The Respondent certifies that the Respondent is not on the Scrutinized Companies that Boycott Israel List, not on the Scrutinized Companies with Activities in Sudan List, not on the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria, as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that the Respondent is unable to provide such certification but still seeks to be considered for award of this solicitation, the Respondent shall, on a separate piece of paper, clearly state that it is on one or both of the Scrutinized Companies lists and shall furnish together with its proposal a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. The Respondent agrees to cooperate fully with the City in any investigation undertaken by the City to determine whether the claimed exception would be applicable. The City shall have the right to terminate any contract resulting from this solicitation for default if the Respondent is found to have submitted a false certification, or to have been placed on the Scrutinized Companies that Boycott Israel List, or to have been placed on the Scrutinized Companies for Activities in Sudan List, or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria.
- 11.7 Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

11.8 To the degree records are not exempt or confidential under Florida's Public Records law, Contractor agrees to comply with Chapter 119, Florida Statutes, and particularly Section 119.0701, Florida Statutes, relating to a contractor's obligation with regard to public records.

11.9 PUBLIC RECORDS COMPLIANCE

The City of Ocoee (City) is a public agency subject to Chapter 119, Florida Statutes. Contractor agrees to comply with Florida's Public Records Law. Specifically, Contractor shall:

1. Keep and maintain public records required by City to perform the service.
2. Upon request from City's custodian of public records, provide City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in chapter 119, Florida Statutes, or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from the public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if Contractor does not transfer the records to City.
4. Upon completion of the contract, Contractor agrees to transfer at no cost to City all public records in possession of Contractor or keep and maintain public records required by City to perform the service. If Contractor transfers all public record to City upon completion of the contract, Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If Contractor keeps and maintains public records upon completion of the contract, Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to City, upon request from City's custodian of public records, in a format that is compatible with the information technology systems of City.
5. A Contractor who fails to provide the public records to City within a reasonable time may be subject to penalties under section 119.10, Florida Statutes.

IF CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 407-905-3100, EXTENSION 1022, CCDL@OCOEE.ORG, WITH AN OFFICE LOCATED AT 1 N. BLUFORD AVENUE, OCOEE, FLORIDA 34761.

11.10 By entering into this Contract, the awarded Contractor is obligated to comply with the provisions of § 448.095, Fla. Stat., "Employment Eligibility." This includes, but is not limited to utilization of the E-Verify System to verify the work authorization status of all newly hired employees, and requiring all subcontractors to provide an affidavit attesting that the subcontractor does not employ, contract with, or subcontract with, an alien unauthorized to work in the USA. Failure to comply will lead to termination of this contract, or if a subcontractor knowingly violates the statute, the subcontractor

must be terminated immediately. If the Contract is terminated pursuant to Section 448.095, Fla. Stat., such termination is not a breach of contract and may not be considered as such. Any challenge to termination under this provision must be filed in the Ninth Judicial Circuit Court of Florida no later than 20 calendar days after the date of termination. If the Contract is terminated for a violation of Section 448.095 Fla. Stat., by the Contractor, the Contractor shall be liable for any additional costs incurred by the City as a result of the termination of the Contract. Nothing in the E-Verify Certification shall be construed to allow intentional discrimination of any class protected by law.

E-VERIFY REGISTRATION AND USE.

- A. Pursuant to section 448.095, Florida Statutes, Contractor shall register with and use the U.S. Department of Homeland Security's E-Verify system, <https://e-verify.uscis.gov/emp>, to verify the work authorization status of all Contractor employees hired on and after January 1, 2021.
- B. Subcontractors
 - (i) Contractor shall also require all subcontractors performing work under this Agreement to use the E-Verify system for any employees they may hire during the term of this Agreement.
 - (ii) Contractor shall obtain from all such subcontractors an affidavit stating the subcontractor does not employ, contract with, or subcontract with an unauthorized alien, as defined in section 448.095, Florida Statutes.
 - (iii) Contractor shall maintain a copy of all subcontractor affidavits for the duration of the Agreement.
- C. Contractor must provide evidence of compliance with section 448.095, Florida Statutes. Evidence shall consist of an affidavit from the Contractor stating all employees hired on and after January 1, 2021 have had their work authorization status verified through the E-Verify system and a copy of their proof of registration in the E-Verify system.
- D. Failure to comply with this provision is a material breach of the Agreement, and shall result in the immediate termination of the Agreement without penalty to the City. Contractor shall be liable for all costs incurred by the City to secure a replacement Agreement, including but not limited to, any increased costs for the same services, any costs due to delay, and rebidding costs, if applicable.

(Remainder of page left blank intentionally.)

IN WITNESS WHEREOF, the parties hereto have signed this Agreement. All portions of the Contract Documents have been signed or identified by Owner and Contractor or by Engineer on his behalf.

CONTRACTOR:

BY: _____

PRINT NAME: _____

TITLE: _____

WITNESSES:

NAME: _____ NAME: _____

TITLE: _____ TITLE: _____

OWNER: CITY OF OCOEE, FLORIDA

ATTEST:

APPROVED:

BY: _____
Melanie Sibbitt, City Clerk

BY: _____
Rusty Johnson, Mayor

(SEAL)

FOR USE AND RELIANCE ONLY BY
THE CITY OF OCOEE, FLORIDA
APPROVED AS TO FORM AND LEGALITY
this ____ day of _____, 202__

APPROVED BY CITY OF OCOEE
COMMISSION AT A MEETING HELD
on _____, under Agenda Item ____.

FISHBACK DOMINICK

BY: _____
Richard S. Geller, Esq., City Attorney

END OF SECTION

SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that _____, (hereinafter referred to as "Principal"), and _____, a corporation organized under the laws of the State of _____ and licensed to do business in the State of _____, (hereinafter referred to as "Surety"), and held and firmly bound unto the City of Ocoee, Florida, as Obligee, (hereinafter referred to as "Obligee"), in the Penal Sum of _____, for the payment of which sum well and truly made, Principal and Surety bind themselves, their heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, 20____, entered into a contract, (hereinafter referred to as the "Contract") with Obligee for the construction of **Ocoee WWTF Electrical Upgrade and Expansion** (hereinafter referred to as the "Project") in accordance with the plans and specifications dated October 2023 and the Project Manual prepared by CPH, LLC and the City of Ocoee dated October 2023; and

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH THAT IF Principal shall well and truly perform all the undertakings, covenants, terms, conditions, and agreements of said Contract including, but not limited to, the making of payments to persons or entities providing labor, materials or services to Principal under the Contract, as well as, fulfilling all warranty obligations required after the Certificate of Completion is issued, within the time provided therein, and any extensions thereof that may be granted by Obligee, and also during the life of any warranty or guaranty required under said Contract, and shall also well and truly perform all undertakings, covenants, terms, conditions, and agreements of any and all duly authorized and modifications of said Contract that may hereafter be made, and shall pay, compensate, indemnify and save harmless the said Obligee of and from any and all loss, damage and expense, or from any breach or default by Principal under the Contract, including, but not limited to, liquidated damages, damages caused by delays in performance of the Principal, expenses, cost and attorneys' fees, including appellate proceedings, that Obligee sustains resulting directly or indirectly from failure of the Principal to perform the Work identified by the Contract, then this obligations shall be null and void; otherwise, it shall remain in full force and effect and Surety shall be liable to Obligee under this Performance Bond.

The Surety's obligations hereunder shall be direct and immediate and not conditional or contingent upon Obligee's pursuit of its remedies against Principal, and shall remain in full force and effect notwithstanding (i) amendments or modifications to the contract or contract entered into by Obligee and Principal without the Surety's knowledge or consent; (ii) waivers of compliance with or any default under the Contract granted by Obligee to Principal or by Principal to Obligee without the Surety's knowledge or consent; (iii) the discharge of Principal from its obligations under the Contract as a result of any proceeding initiated under The Bankruptcy Code of 1978, as the same may be amended, or any similar state or federal law, or any limitation of the liability of Principal or its estate as a result of any such proceedings; or (iv)

any other action taken by Obligee or Principal that would, in the absence of this clause, result in the release or discharge by operation of law of the Surety from its obligations hereunder.

In the event that the Surety fails to fulfill its obligations under this Performance Bond, then the Surety shall also indemnify and save the Obligee harmless from any and all loss, damage, cost and expense, including reasonable attorneys' fees and other legal costs for all trial and appellate proceedings, resulting directly or indirectly from the Surety's failure to fulfill its obligations hereunder. This paragraph shall survive the termination or cancellation of this Performance Bond. The obligations set forth in this paragraph shall not be limited by the Penal Sum of this Bond.

Any changes in or under the Contract or the Contract and compliance or noncompliance with any formalities connected with the Contract or the Contract or the changes therein shall not affect Surety's obligations under this bond, and Surety hereby waives notice of any such changes. Further, Principal and Surety acknowledge that the Penal Sum of this bond shall increase or decrease in accordance with approved changes or modifications to the Contract.

The said Principal and the said surety agree that this bond shall inure to the benefit of all persons supplying labor and material in the prosecution of the work provided for in the said subcontract, as well as to the Obligee, and that such persons may maintain independent actions upon this bond in their own names.

IN WITNESS WHEREOF, Principal and Surety have executed this instrument under their several seals on the _____ day of _____, 20__, the name and corporate seal of each corporate party being hereto affixed and these presents fully signed by its undersigned representative, pursuant to the authority of its governing body.

Signed, sealed and delivered in the presence of:

Principal

By: _____ (SEAL)

(Official Title)

Surety

By: _____ (SEAL)

(Official Title)

NOTES: If Principal and Surety are corporations, the respective corporate seal should be affixed and attached.

Surety shall execute and attach a certified copy of Power of Attorney Appointing Individual Attorney-In-Fact for execution of Performance Bond on behalf of Surety.

END OF SECTION

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

00610-2

SECTION 00620
STATUTORY PAYMENT BOND

Bidder shall provide the City with a Statutory Payment Bond in the amount of the contract bid.

Statutory Payment Bond
Pursuant to Florida Statutes, 255.05, et seq.

KNOW ALL MEN BY THESE PRESENTS, THAT _____
(hereinafter called the "Principal"), as Principal, and _____, a
corporation organized and existing under the laws of the State of _____, hereinafter
called the "Surety"), as Surety, are held and firmly bound unto the City of Ocoee, Florida,
(hereinafter called the "Obligee"), by bond number _____ in the sum of _____
_____ Dollars and _____ Cents (\$_____), for
the payment of which sum well and truly to be made, the said Principal and Surety bind
themselves, and their respective heirs, administrators, executors, successors and assigns, jointly
and severally, firmly by these presents.

WHEREAS, the Principal has entered into a written Contract with the Obligee dated _____
_____, 20__ to perform, as Contractor, in accordance with the Contract and
Contract Documents, which Contract and Contract Documents are hereby incorporated herein by
reference.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the
Principal promptly makes payments to all claimants, as defined in Section 255.05 (1), Florida
Statutes, that provide or furnish the Principal with labor, materials, or supplies, used directly or
indirectly by Principal in the prosecution of the work provided for in the contract, then this
obligation shall be null and void; otherwise it shall remain in full force and effect.

The Principal and the Surety agree that this Bond shall inure to the benefit of all
claimants, as defined in Section 255.05 (1), Florida Statutes, that provide or furnish the Principal
with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the
work provided for in said Contract, and that any such claimant may maintain an independent
action upon this Bond in its own name.

The provisions of Florida Statutes, Section 255.05, et seq. are hereby incorporated herein
by reference and made a part of this payment bond including, but not limited to, the notice and
time limitation provisions in subsection (2). Any action instituted by a claimant under this bond
for payment must be in accordance with the notice and time limitation provisions in Section
255.05 (2), Florida Statutes.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____(Seal)
(Principal)

By _____
(Name & Title)

(Signature)

Witness or Secretary's Attestation

_____(Seal)
(Surety)

By _____
(Name & Title*)

(Signature)

Witness or Secretary's Attestation

*Attach Power-Of-Attorney

END OF SECTION

SECTION 00630

CONSTRUCTION PERFORMANCE AND PAYMENT BONDS

CITY OF OCOEE

ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid

I, _____, certify that I am the Secretary of the corporation named as Principal in the foregoing Construction Performance and Payment Bonds; that _____, who signed the said Bonds on behalf of the Principal, was then _____ of said corporation; that I know (his, her) signature, and (his, her) signature thereto is genuine, and that said Bonds were duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

Secretary

(Corporate Seal)

(SURETY COMPANY LETTERHEAD)

_____, 20__

Shannon Hopper
Purchasing Technician
City of Ocoee
1 N. Bluford Avenue
Ocoee, FL 34761
(407) 905-3100 ext. 1524

RE: Construction Performance and Payment Bonds
Authority to Date Bond and Power of Attorney
Bond No.: _____
Project Name: CITY OF OCOEE
ITB #24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid

Dear Ms. Hopper:

Please be advised that as Obligee on the above referenced bond executed in your behalf for the captioned project, you are hereby authorized to date the bonds and the powers of attorney concurrent with the date of the contract.

Best Regards,

(Surety Company's Name)

Attorney-in-Fact

END OF SECTION

SECTION 00640

WAIVER OF RIGHT TO CLAIM AGAINST
THE PAYMENT BOND (FINAL PAYMENT)
(SECTION 255.05)

The undersigned, in consideration of the final payment in the amount of \$ _____
hereby waives its right to claim against the payment bond for labor, services, or materials furnished
to _____ insert the name of your customer) on the job of _____
(insert name of the owner), for improvements to the following described project:

DESCRIPTION OF PROJECT:

- Ocoee WWTF Electrical Upgrade and Expansion project is located in, Ocoee, Florida. All Work for the project shall be constructed in accordance with the drawings and specifications prepared for the City by CPH, LLC. The Project will be awarded and constructed, in conformance with these plans, specifications, Project Manual and City of Ocoee Engineering Standards Manual. Bids shall be deemed to include all items necessary for the furnishing, delivering, and installing of all materials, equipment, incidentals, and services, including all labor for the work to construct and make complete the Ocoee WWTF Electrical Upgrade and Expansion.
- Work under this contract comprises furnishing the labor, material, equipment, tools, services and other incidentals required to construct and make complete for use the construction of Ocoee WWTF Electrical Upgrade and Expansion. The project consists generally of the construction of a new electrical building for the City's wastewater treatment facility.
- This Scope of Work is not to be limited by this description and will include additional and incidental related work as required and more fully set forth in the Contract Documents.
- Omission of a specific item or component part of a system obviously necessary for the proper functioning of the system shall not relieve the Contractor of the responsibility of furnishing the item as part of the work at no additional cost to the Owner.
- The Contractor shall perform the work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, cleanup, replacements and restoration required as a result of damages caused during this construction.

DATE _____,

_____ (Claimant)

By: _____

END OF SECTION

SECTION 00650
INSURANCE CERTIFICATE

Bidder is to provide City of Ocoee with completed Certificate Liability Insurance listing City of Ocoee as a Certificate Holder, and listing the City of Ocoee as Additional Insured.

ACORD CERTIFICATE OF LIABILITY INSURANCE				OP ID JC FRAZE-1	DATE (MM/DD/YYYY) 11/04/04
PRODUCER		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.			
INSURED		INSURERS AFFORDING COVERAGE		NAIC #	
Contractor's Name Address		INSURER A: AM Best Rating A- or Better			
		INSURER B:			
		INSURER C:			
		INSURER D:			
		INSURER E:			
COVERAGES					
THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.					
INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
X	GENERAL LIABILITY				EACH OCCURRENCE \$ 1,000,000
	X COMMERCIAL GENERAL LIABILITY				DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000
	CLAIMS MADE X OCCUR				MED EXP (Any one person) \$ 5,000
					PERSONAL & ADV INJURY \$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:				GENERAL AGGREGATE \$ 2,000,000
	POLICY X PRO-JECT LOC				PRODUCTS - COMP/OP AGG \$ 2,000,000
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000
	X ANY AUTO				BODILY INJURY (Per person) \$
	ALL OWNED AUTOS				BODILY INJURY (Per accident) \$
	SCHEDULED AUTOS				PROPERTY DAMAGE (Per accident) \$
	X HIRED AUTOS				AUTO ONLY - EA ACCIDENT \$
	X NON-OWNED AUTOS				OTHER THAN EA ACC: \$
					AUTO ONLY: AGG \$
	GARAGE LIABILITY				EACH OCCURRENCE \$ 1,000,000
	ANY AUTO				AGGREGATE \$ 2,000,000
					\$
					\$
					\$
X	EXCESS/UMBRELLA LIABILITY				X WC STATU-TORY LIMITS OTH-ER
	X OCCUR CLAIMS MADE				E.L. EACH ACCIDENT \$ 500,000
	DEDUCTIBLE				E.L. DISEASE - EA EMPLOYEE \$ 500,000
	RETENTION \$				E.L. DISEASE - POLICY LIMIT \$ 500,000
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED?				
	If yes, describe under SPECIAL PROVISIONS below				
	OTHER				
	Builders Risk				Any 1 Loc 100,000 Any 1 Occ 1,000,000
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS					
The insurance evidenced by this certificate shall name the certificate holders as an additional insured on the General Liability & Umbrella Liability. Workers' Compensation, Employers' Liability & General Liability shall contain a Waiver of Subrogation in favor of the certificate holder. The certificate holder is added as a named insured for Builders Risk.					
CERTIFICATE HOLDER			CANCELLATION		
Ocoee01			SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.		
City of Ocoee 150 N. Lakeshore Drive Ocoee FL 34761-2258			AUTHORIZED REPRESENTATIVE		

ACORD 25 (2001/08)

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SAMPLE

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

City of Ocoee
(Revised November, 2023)

Notice: This section of the Project Manual is derived and adapted from the EJCDC C-710 Standard General Conditions of the Construction Contract, Funding Agency Edition, but has been substantially modified to conform to the needs of the City of Ocoee. The City does not represent or imply that this is an EJCDC document. Those portions included from EJCDC publications are copyrighted and subject to the terms and conditions of a license granted to the City of Ocoee for their use.

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TABLE OF CONTENTS

	Page
Article 1 – Definitions and Terminology.....	5
1.01 Defined Terms.....	5
1.02 Terminology.....	8
Article 2 – Preliminary Matters	9
2.01 Delivery of Bonds and Evidence of Insurance	9
2.02 Copies of Documents	10
2.03 Commencement of Contract Times; Notice to Proceed	10
2.04 Starting the Work	10
2.05 Before Starting Construction	10
2.06 Preconstruction Conference	10
2.07 Initial Acceptance of Schedules.....	10
Article 3 – Contract Documents: Intent, Amending, Reuse	11
3.01 Intent.....	11
3.02 Reference Standards.....	11
3.03 Reporting and Resolving Discrepancies	11
3.04 Amending and Supplementing Contract Documents.....	12
3.05 Reuse of Documents	12
3.06 Electronic Data.....	12
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points.....	13
4.01 Availability of Lands.....	13
4.02 Subsurface and Physical Conditions	13
4.03 Differing Subsurface or Physical Conditions.....	14
4.04 Underground Facilities.....	15
4.05 Reference Points.....	16
4.06 Hazardous Environmental Condition at Site	16
Article 5 – Bonds and Insurance.....	17
5.01 Performance, Payment, and Other Bonds.....	17
5.02 Licensed Sureties and Insurers.....	18
5.03 Certificates of Insurance.....	18
5.04 Contractor’s Liability Insurance	18
5.05 Owner’s Liability Insurance.....	20
5.06 Property Insurance	21
5.07 Waiver of Rights	22
5.08 Receipt and Application of Insurance Proceeds	22
5.09 Acceptance of Bonds and Insurance; Option to Replace	23
5.10 Partial Utilization, Acknowledgment of Property Insurer.....	23
Article 6 – Contractor’s Responsibilities.....	23
6.01 Supervision and Superintendence	23
6.02 Labor; Working Hours	23
6.03 Services, Materials, and Equipment.....	25
6.04 Progress Schedule	25
6.05 Substitutes and “Or-Equals”	25
6.06 Concerning Subcontractors, Suppliers, and Others	27
6.07 Patent Fees and Royalties.....	29
6.08 Permits.....	29
6.09 Laws and Regulations	29
6.10 Taxes	29

6.11	Use of Site and Other Areas.....	29
6.12	Record Documents.....	30
6.13	Safety and Protection	30
6.14	Safety Representative.....	31
6.15	Hazard Communication Programs.....	31
6.16	Emergencies	31
6.17	Shop Drawings and Samples.....	32
6.18	Continuing the Work.....	33
6.19	Contractor's General Warranty and Guarantee	33
6.20	Indemnification	34
6.21	Delegation of Professional Design Services.....	34
Article 7 – Other Work at the Site		35
7.01	Related Work at Site	35
7.02	Coordination.....	35
7.03	Legal Relationships	36
Article 8 – Owner's Responsibilities		36
8.01	Communications to Contractor	36
8.02	Replacement of Engineer	36
8.03	Furnish Data	36
8.04	Pay When Due.....	36
8.05	Lands and Easements; Reports and Tests.....	36
8.06	Insurance	36
8.07	Change Orders.....	36
8.08	Inspections, Tests, and Approvals	36
8.09	Limitations on Owner's Responsibilities	37
8.10	Undisclosed Hazardous Environmental Condition.....	37
Article 9 – Engineer's Status During Construction		37
9.01	Owner's Representative	37
9.02	Visits to Site	37
9.03	Project Representative.....	37
9.04	Authorized Variations in Work.....	40
9.05	Rejecting Defective Work.....	41
9.06	Shop Drawings, Change Orders and Payments	41
9.07	Determinations for Unit Price Work.....	41
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work.....	41
9.09	Limitations on Engineer's Authority and Responsibilities	41
Article 10 – Changes in the Work; Claims		42
10.01	Authorized Changes in the Work.....	42
10.02	Unauthorized Changes in the Work.....	42
10.03	Execution of Change Orders.....	42
10.04	Notification to Surety.....	43
10.05	Claims.....	43
Article 11 – Cost of the Work; Allowances; Unit Price Work.....		43
11.01	Cost of the Work	43
11.02	Allowances	45
11.03	Unit Price Work	46
Article 12 – Change of Contract Price; Change of Contract Times		46
12.01	Change of Contract Price	46
12.02	Change of Contract Times	48

12.03	Delays.....	48
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work		49
13.01	Notice of Defects.....	49
13.02	Access to Work	49
13.03	Tests and Inspections	49
13.04	Uncovering Work.....	50
13.05	Owner May Stop the Work.....	50
13.06	Correction or Removal of Defective Work	50
13.07	Correction Period	50
13.08	Acceptance of Defective Work.....	51
13.09	Owner May Correct Defective Work.....	51
Article 14 – Payments to Contractor and Completion.....		52
14.01	Schedule of Values.....	52
14.02	Progress Payments	52
14.03	Contractor’s Warranty of Title.....	55
14.04	Substantial Completion	55
14.05	Partial Utilization	55
14.06	Final Inspection.....	56
14.07	Final Payment.....	56
14.08	Final Completion Delayed	57
14.09	Waiver of Claims	57
Article 15 – Suspension of Work and Termination.....		58
15.01	Owner May Suspend Work.....	58
15.02	Owner May Terminate for Cause.....	58
15.03	Owner May Terminate For Convenience	59
15.04	Contractor May Stop Work or Terminate.....	59
Article 16 – Dispute Resolution.....		59
16.01	Methods and Procedures	61
Article 17 – Miscellaneous		60
17.01	Giving Notice	60
17.02	Computation of Times.....	60
17.03	Cumulative Remedies	60
17.04	Survival of Obligations	61
17.05	Controlling Law	62
17.06	Headings.....	61
Article 18 – Federal Requirements		62
18.01	Agency Not a Party	62
18.02	Contract Approval.....	62
18.03	Conflict of Interest	62
18.04	Gratuities	62
18.05	Audit and Access to Records	62
18.06	Small, Minority and Women’s Businesses	63
18.07	Anti-Kickback	63
18.08	Clean Air and Pollution Control Acts.....	63
18.09	State Energy Policy	63
18.10	Equal Opportunity Requirements.....	63
18.11	Restrictions on Lobbying	64
18.12	Environmental Requirements.....	64

GENERAL CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda* – Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agency* – The Federal or state governmental agency named as such in the Agreement, which in this instance is the City of Ocoee.
 3. *Agreement* – The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 4. *Application for Payment* – The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 5. *Asbestos* – Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 6. *Bid* – The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 7. *Bidder* – The individual or entity who submits a Bid directly to Owner in accordance with the Bidding Documents.
 8. *Bidding Documents* – The Bidding Requirements and the proposed Contract Documents (including all Addenda). This may include the Invitation to Bid and the Instructions to Bidders
 9. *Bidding Requirements* – The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.
 10. *Change Order* – A document recommended by Engineer which is signed by Contractor and Owner and Agency and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 11. *Claim* – A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 12. *Contract* – The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

13. *Contract Documents* – Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
14. *Contract Price* – The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
15. *Contract Times* – The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
16. *Contractor* – The individual or entity with whom Owner has entered into the Agreement.
17. *Cost of the Work* – See Paragraph 11.01.A for definition.
18. *Drawings* – That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
19. *Effective Date of the Agreement* – The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
20. *Engineer* – The individual or entity named as such in the Agreement.
21. *Field Order* – A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
22. *General Requirements* – Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
23. *Hazardous Environmental Condition* – The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.
24. *Hazardous Waste* – The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
25. *Laws and Regulations; Laws or Regulations* – Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens* – Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
27. *Milestone* – A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
28. *Notice of Award* – The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
29. *Notice to Proceed* – A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

30. *Owner* – The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed. For purposes of this Agreement, the Owner is the City of Ocoee, referred to either as the City or the Owner.
31. *PCBs* – Polychlorinated biphenyls.
32. *Petroleum* – Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
33. *Progress Schedule* – A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
34. *Project* – The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
35. *Project Manual* – The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
36. *Radioactive Material* – Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
37. *Related Entity* – An officer, director, partner, employee, agent, consultant, or subcontractor.
38. *Resident Project Representative* – The authorized representative of Engineer who may be assigned to the Site or any part thereof.
39. *Samples* – Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
40. *Schedule of Submittals* – A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
41. *Schedule of Values* – A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
42. *Shop Drawings* – All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
43. *Site* – Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
44. *Specifications* – That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. The Specifications are included in the Project Manual for the project.
45. *Subcontractor* – An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

46. *Substantial Completion* – The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof. Final Completion shall be achieved only by acceptance of all of the Work by the Owner, as evidenced by its signature on the Final Certificate of Completion, which, in any event, shall only occur after the Owner has observed and approved such demonstration testing of the Project or has otherwise assured itself that all of the provisions and requirements of the Contract Documents have been fully satisfied.
47. *Successful Bidder* – The Bidder submitting a responsive Bid to whom Owner makes an award.
48. *Supplementary Conditions* – That part of the Contract Documents which amends or supplements these General Conditions.
49. *Supplier* – A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.
50. *Underground Facilities* – All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
51. *Unit Price Work* – Work to be paid for on the basis of unit prices.
52. *Work* – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
53. *Work Change Directive* – A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and Agency upon recommendation of the Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

- A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.
- B. *Intent of Certain Terms or Adjectives*
 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work

or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents, or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

- F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish in accordance with applicable Florida Law.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. After the Contract has been executed, the Contractor will be furnished one (1) complete set of reproducible plans in electronic format, three (3) signed and sealed full-size prints, and one (1) 11"x17" print of the Drawings, one (1) complete set of the Project Manual (Contract Requirements and Specifications), and one (1) complete set of all addenda. The Contractor shall furnish each of the subcontractors, manufacturers, and material men such copies of the Contract Documents as may be required for their work. All copies of the Contract Documents shall be printed from the reproducible sets furnished to the Contractor. All costs of reproduction and printing shall be borne by the Contractor. The Contractor shall submit a complete set of reproducible Mylar ® sepia's back to the Engineer as Project Record Drawings, as addressed in Section 1.07.E of the Contract General Requirements.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. A Notice to Proceed may be given to Contractor at any time within thirty (30) days after the Effective Date of the Agreement. The Contract Time will commence to run on the date specified in the Notice to Proceed.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 21 days after the Contract Award, but in any event no later than the Preconstruction Conference, Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, Agency, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

- A. Reporting Discrepancies
 1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
 2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3) or
 3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or
 2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.
- B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or

procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.
- D. If all lands and rights-of-way are not obtained as herein contemplated before construction begins, CONTRACTOR shall begin the Work upon such land and rights-of-way as OWNER has previously acquired and no claim for damages whatsoever will be allowed by reason of the delay in obtaining the remaining lands and rights-of-way. Should OWNER be prevented or enjoined from proceeding with the Work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation, or by reason of its inability to procure any lands or rights-of-way for the Work, CONTRACTOR shall not be entitled to make or assert a claim for Additional Compensation by reason of said delay, or to withdraw from the Agreement except by consent of OWNER. Time for completion of the Work will be extended as provided in Article 12, to such time as OWNER determines will compensate for the time lost by such delay." An extension of Contract time will be Contractor's sole and exclusive remedy of delay.

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Contract Documents may identify:
 - 1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and
 - 2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the

Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
- 3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

- 1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and
- 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data,
 - b. locating all Underground Facilities shown or indicated in the Contract Documents,
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

- 1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- 2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 The Contractor shall have no claim for an adjustment in Contract Price or Contract Times (or Milestones) under this Article 4 unless (1) CONTRACTOR has given the written notice required in as set forth herein not later than thirty (30) days after the event giving rise thereto), and (2) within sixty (60) days after the event giving rise thereto, CONTRACTOR shall submit to OWNER a detailed claim setting forth CONTRACTOR'S right to an increase in Contract Price or extension of Contract Time. No claim by the CONTRACTOR hereunder shall be allowed if asserted after final payment under this Contract.

4.06 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.
- B. Engineer may check the lines, elevations, reference marks, batter boards, etc., set by Contractor, and Contractor shall correct any errors disclosed by such check. Such a check shall not be considered as approval of Contractor's work and shall not relieve Contractor of the responsibility for accurate construction of the entire Work. Contractor shall furnish personnel to assist Engineer in checking lines and grades."

4.07 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter

confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.
- J. Contractor shall be responsible for all safety measures concerning the handling of all asbestos pipe to be removed as relocated under This Agreement. Contractor shall indemnify the Owner, its agents, employees, and officials from and against all claims, costs, losses and damages, including but not limited to attorneys' fees and other professional fees, arising out of and relating to the removal and/or relocation of asbestos pipe.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents all in accordance with applicable Florida Statutes, including but not limited to, Florida Statutes, 255.05, et seq. . These bonds shall be in form and content as identified in the Instructions To Bidders or otherwise in the Contract

Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents. The City of Ocoee has specified a form of a performance bond which shall be used for this project.

- B. All bonds shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions or below.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured identified below in this Article or in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured identified as identified below or in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

- A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified below or in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided below or in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include completed operations insurance;
4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified below or in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

C. Contractor shall furnish Owner and each other additional insured identified below or in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

D. The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under paragraphs 5.04.A.1 and A.2 of the General Conditions:
 - a. State: Statutory
 - b. Applicable Federal (e.g., Longshoreman's): Statutory
 - c. Employer's Liability: ***
2. Contractor's General Liability under paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:
 - a. General Aggregate 2,000,000

- | | |
|--|-----------|
| b. Products - Completed Operations Aggregate | 1,000,000 |
| c. Personal and Advertising Injury | 1,000,000 |
| d. Each Occurrence (Bodily Injury and Property Damage) | 1,000,000 |
| e. Personal Injury Liability Coverage will include Claims arising out of Employment. | |
| f. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable. | |
| g. Excess or Umbrella Liability | 2,000,000 |
| 1) General Aggregate | |
| 2) Each Occurrence | |
3. Automobile Liability under paragraph 5.04.A.6 of the General Conditions:
- | | |
|---------------------|-------------|
| a. Bodily Injury: | |
| Each person | \$1,000,000 |
| Each Accident | \$1,000,000 |
| b. Property Damage: | |
| Each Accident | \$1,000,000 |
| OR | |
| c. Combined Single | |
| Limit of | \$1,000,000 |
4. The Contractual Liability coverage required by paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:
- | | |
|---------------------|-------------|
| a. Bodily Injury: | |
| Each Accident | \$1,000,000 |
| Annual Aggregate | \$2,000,000 |
| b. Property Damage: | |
| Each Accident | \$1,000,000 |
| Annual Aggregate | \$2,000,000 |
5. Additional Insureds:
- [name and address of design firm, if any]
- City of Ocoee
1 N. Bluford Avenue
Ocoee, FL 34761
- Others, as may be identified by the OWNER

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against

claims which may arise from operations under the Contract Documents. The Owner shall not have the duty or obligation to purchase or maintain such insurance and nothing herein shall be so deemed to require same.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (Contractor shall be responsible for any deductible or self-insured retention.). This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;
 2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.
- B. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

- E. Where applicable, the Contractor shall purchase and maintain adequate flood insurance for work within designated flood hazard areas as defined by P.L. 93-234 (Flood Disaster Protection Act).

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Contractor as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Contractor and made payable to Contractor as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Contractor shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof.
- B. Contractor as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Contractor's exercise of this power. If such objection be made, Contractor as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If Owner has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by Contractor in accordance with this Article 5 on the basis of its not complying with the Contract Documents, Owner will notify Contractor in writing thereof within ten days of the date of delivery of such certificates to Owner. Contractor will provide such additional information in respect of insurance provided by him as Owner may reasonably request.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor’s representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.
- C. Except in the event of an emergency, no work shall be performed (1) before sunrise and after sunset, (2) nor between the hours of 7:00 p.m. and 7:00 a.m. (3) nor on Saturday and Sunday and (4) nor on any holiday of the Owner. "Regular Working Hours" shall be between 7:00 a.m. and 7:00 p.m. and shall be established by the Contractor at the Pre-construction Meeting, provided the total working hours shall not exceed eight (8) hours per day and forty (40) hours per week. If construction or maintenance work requires operations during other than Regular Working Hours, the Contractor shall obtain written permission of the Owner at least forty-eight (48) hours in advance of starting such work, and shall set forth the proposed schedule for overtime to give Owner ample time to arrange for his personnel to be at the site of the work. Contractor shall pay for the additional charges to the Owner on account of such overtime work. Such additional charges shall be a subsidiary obligation of Contractor and no extra payment shall be made by Owner on account of such overtime work.

- D. This Agreement is subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, Public Law 87-581, 87th Congress. No Contractor or Subcontractor contracting for any part of the Work shall require or permit any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of forty hours in such work week, as the case may be.
- E. Except as may be otherwise required by law, all claims and disputes pertaining to the classification of labor employed on the project under this Contract shall be decided by Owner's governing body or other duly designated official.
- F. Contractor shall employ only competent persons to do the work and whenever Owner shall notify Contractor, in writing, that any person on the Work appears to be incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such person shall be removed from the Project and shall not again be employed on it except with the consent of Owner.
- G. Contractor and Subcontractors shall, insofar as practicable, give preference in the hiring of workers for the Project to qualified local residents with first preference being given to citizens of the United States who have served in the armed forces of the United States and have been honorably discharged therefrom or released from active duty therein.
- H. Contractor shall reimburse the Owner the reasonable and customary amounts the Owner incurs for additional engineering and/or inspection costs incurred as a result of overtime work in excess of the regular working hours. Overtime costs shall be deducted from the Contract amount by written Change Order (Contract Modification). Overtime costs for the Owner's personnel shall be based on the individual's current overtime wage rate and shall include labor burden, etc. Overtime costs for personnel employed by the Engineer or Owner's independent testing laboratory shall be calculated in accordance with the terms of their respective contracts with the Owner
- I. No work shall be performed on legal holidays of the Owner, which for the Work are defined as follows:

Holiday

Calendar Date

CITY OF OCOEE TO CONFIRM HOLIDAYS

Holiday

Calendar Date

New Year's Day

January 1

Martin Luther King Day

Third Monday in January

Memorial Day

Last Monday in May

Independence Day

July 4 (may be observed on the prior Friday or following Monday)

Labor Day

First Monday in September

Thanksgiving Day

4th Thursday in November

Day after Thanksgiving

4th Friday in November

Christmas Eve

December 24

Christmas

December 25

If Christmas and Christmas Eve fall on a weekend, the preceding Friday and following Monday will be observed as holidays. If Christmas falls on a Monday, the preceding Friday will be

observed as a holiday. If Christmas falls on a Saturday, the preceding Thursday will be observed as a holiday.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
- b. Contractor certifies that, if approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times, and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
2. Substitute Items
- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
 - b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
 - c. The procedure requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.
 - d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) will perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;
 - b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services;

- 4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute; and all costs resulting from any delays in the Work while the substitution was undergoing reviews.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.
- G. Equipment specifications containing experience clauses requires equipment manufacturers to have a record (min. number installations and years of operation) of satisfactory operation. In lieu of experience, a manufacturer/supplier may provide the equipment with the mutual understanding of all parties that no payment shall be released for such equipment including installation costs until it is demonstrated that the equipment meets the specific design performance requirements. All such monies retained shall be held by the Owner in an interest bearing escrow account from the date of application for payment for such work until the date of demonstrated conformance. All such retained monies and accrued interest shall be released to the Contractor upon demonstrated conformance. All monies not paid by the Owner shall bear interest a 7 percent per annum or the maximum rate provided by law, whichever is less. Where the equipment has failed specified tests to demonstrate conformance to the design requirements, the Contract shall remove said equipment and shall substitute the equipment as approved by the Owner/Engineer as specified having the required experience. The Contractor shall install the substituted equipment as required to provide a complete and functional system without cost to the Owner. (Refer to GC-13.07). No experience restriction will be permitted which unnecessarily reduces competition or innovation.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Instructions to Bidders or the Invitation To Bid requires the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior

to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with those requirements, then any such Subcontractor, Supplier, or other individuals or entities so identified and not objected to in writing by Owner or Engineer prior to the execution of the Agreement will be deemed acceptable to Owner and Engineer. All other Subcontractors, Suppliers, or other individuals or entities so identified shall be deemed to have been accepted if Owner or Engineer deliver no written objection thereto within forty-five (45) days after Contractor's written identification of such Subcontractors, Suppliers, or other individuals or entities. However, if within said forty-five (45) day period, Owner or Engineer has reasonable objection to any Subcontractors, Suppliers, or other individuals or entities whether previously identified or subsequently, Contractor shall submit an acceptable substitute without entitlement to any change in Contract Price. If Owner or Engineer demands the substitution at any time and it is determined that the Owner or Engineer did not have a reasonable objection, the Contractor shall comply with the demand for substitution and shall be entitled to an adjustment in the Contract Price (by appropriate Change order or Written Amendment) for the difference in cost resulting directly from such substitution. After acceptance by the Owner or Engineer of any particular Subcontractor, Supplier, or other individuals or entities, the Contractor shall make no substitution without written approval of the Owner, which may be granted or withheld at Owner's sole discretion. No acceptance by Owner or Engineer of any such Subcontractor, Supplier or any other person or organization shall be deemed to constitute a waiver or an estoppel of any right of Owner or Engineer to reject defective work performed in whole or in part by any such Subcontractor, Supplier, or other individual or entity.

- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor
 - 2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work. Reference is made to the Bidding Requirements of the Contract Documents for a list of permits and licenses obtained by the OWNER before the bid advertisement.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work. Use of Owner's existing buildings or lands by the Contractor for storage of materials and equipment will not be permitted. Use of existing washrooms, lavatories, sanitary facilities or plumbing facilities by the Contractor or any of his employees or Subcontractors will not be permitted.
 2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work, Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
1. all persons on the Site or who may be affected by the Work;
 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
 4. In the event of temporary suspension of the Work, or during inclement weather, or whenever Engineer may direct; Contractor shall, and shall cause Subcontractors, to protect carefully the Work and materials against damage or injury from the weather. If, in the opinion of Engineer, any portion of Work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any Subcontractors to so protect the Work, such Work and materials shall be removed and replaced at the expense of Contractor.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. Contractor shall comply with the Trench Safety Act, Florida Law, Chapter 90-96 (CS/SB2626); OSHA (P.L. 91-596); the Contract Work Hours and Safety Standards Act (P.L. 91-54); and the Federal Register 29 CFR part 1926, OSHA Subpart P, and all federal requirements as part of the federal grant as stated in the solicitation and contract, as well as all other local, state and federal ordinances, laws, and regulations regarding safety.
- C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the

Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.
 - 1. *Shop Drawings*
 - a. Submit number of copies specified in the General Requirements.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.
 - 2. *Samples*
 - a. Submit number of Samples specified in the Specifications.
 - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Submittal Procedures*
 - 1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:
 - a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;
 - c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and
 - d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
 - 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 - 3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner for a period of one (1) year following the issuance of the Certificate of Completion for the project that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
4. use or occupancy of the Work or any part thereof by Owner;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
6. any inspection, test, or approval by others; or
7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. The Contractor shall indemnify and hold harmless the City of Ocoee, and its agents, officials and employees, from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Contractor or persons employed or utilized by the Contractor in the performance of the construction contract.
- B. In any and all claims against the City of Ocoee or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:
 1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other

submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- D. The Contract Time stipulated for this Construction Contract may also include the time required for utility construction by others as addressed by any Utility Relocation Schedule(s) included within the Contract Documents or Information Available to Bidders, and/or pursuant to referenced utility relocation period(s) detailed under the Contract General Requirements

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

- A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. Owner will furnish a Resident Project Representative to observe the performance of the Work. The duties, responsibilities and limitations of authority of this Resident Project Representative (and assistants) are as follows:
- B. The Resident Project Representative (RPR) will act as directed by and under the supervision of OWNER, and will confer with Owner and Engineer. RPR's dealings in matters pertaining to the on-site work shall, in general, be only with Owner, Engineer, and Contractor, and dealings with subcontractors shall only be through or with the full knowledge and approval of Contractor.
- C. DUTIES AND RESPONSIBILITIES OF RPR

1. Schedules: Review the progress schedule, schedule of Shop Drawing submittals, and schedule of values prepared by Contractor and consult with Owner and Engineer concerning the acceptability of these submittals.
2. Conferences and Meetings: Attend meetings with Contractor, such as pre-construction conferences, progress meetings, job conferences, and other project-related meetings.
3. Communications by the RPR
 - a. The RPR shall communicate with the Contractor on the site working principally through the Contractor's project manager and superintendent to facilitate communications between the Engineer and the Owner and to advise the Contractor and the Engineer when the construction operations need to be adjusted to serve the purposes of the Owner on the site.
 - b. As requested by Contractor obtain from Owner and Engineer additional details or information, when required for proper execution of the work.
4. Shop Drawings and Samples
 - a. Record date of receipt of Field Shop Drawings and samples.
 - b. Receive samples which are furnished at the site by Contractor, and notify Engineer of the availability of samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any Work requiring a Shop Drawing or sample if the submittal has not been approved by the Engineer.
5. Review of Work, Rejection of Defective Work, Inspections and Tests
 - a. Conduct on-site observations of the Work in progress to assist Engineer in determining if the Work is, in general, proceeding in accordance with the Contract documents.
 - b. Report to Owner and Engineer whenever the RPR believes that any Work will not produce a completed Project that conforms generally to the Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Owner and Engineer of work the RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
 - c. Verify that tests, equipment and systems startups and operating and maintenance training are conducted in presence of appropriate personnel, and that Contractor maintains adequate records thereof; observe, record and report to Owner and Engineer appropriate details relative to the test procedures and startups.
 - d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections, and report to Owner and Engineer.
6. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report them with RPR'S recommendations to Owner and Engineer. Transmit to Contractor in writing decisions as issued by Owner and Engineer.

8. Records

- a. Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions of original Contract Documents including all Work Change Directives, Addenda, Change Orders, Field orders, additional Drawings issued subsequent to the execution of the Contract, Engineer's clarifications and interpretations of the Contract Documents, progress reports, and other Project-related documents.
- b. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the job site, weather conditions, data relative to questions of Work Change Directives, Change Orders, or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as the case of observing test procedures; and send copies to Engineer.
- c. Record names, addresses, and telephone numbers of Contractor, subcontractors, and major suppliers of materials and equipment.

9. Reports

- a. Contractor and Engineer shall furnish the RPR with periodic reports as required of progress of the Work and Contractor's compliance with the progress schedule.
- b. Contractor and Engineer shall consult with the RPR in advance of scheduled major tests, inspections or start of important phases of the Work.
- c. Contractor and Engineer shall work with the RPR to draft proposed Change Orders and Work Change Directives, by providing backup material. The RPR may from time to time recommend that Change Orders, Work Change Directives and Field Orders be issued. .

10. Payment Requisitions: The RPR may assist in the review of applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work. Initial approved percentages of completion with respect to the schedule of values.

11. Certificates, Maintenance and Operation Manuals: During the course of the Work, the RPR may assist to verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Engineer for review and forward same to Owner prior to final payment for the Work.

12. Completion

- a. The RPR may, before the Contractor submits a request for a substantial completion inspection, submit to the Contractor a list of observed items requiring completion or correction.
- b. The RPR may, but shall not be required, to advise the Contractor or the Engineer whether Contractor has performed inspections required by laws, rules, regulations, ordinances, codes, or orders applicable to the Work, including but not limited to those to be performed by public agencies having jurisdiction over the Work, including but not limited to, the City of Ocoee.
- c. The RPR may also assist in conducting final inspection together with the Engineer, Owner and Contractor and assist in preparing a final list of items to be completed and corrected. In accordance with Florida Statutes Section §218.735, within 30 calendar days of reaching substantial completion of the construction services, or 45 days if over \$10 million construction cost, the Owner and

Contractor shall work together to develop the single list of items and the estimated cost to complete each item on the list required to render complete, satisfactory, and acceptable the construction services purchased by the Owner. See also General Conditions Section 710 of the bid package, and Section 5 of the Contract, Payment Procedures.

- d. The RPR may observe whether all items on final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

D. LIMITATIONS OF AUTHORITY

Resident Project Representative

1. By taking any such action as noted above, the RPR shall not be deemed to have authorized any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items), unless same is expressly authorized by Engineer in accordance with this Agreement.
2. By taking such action as noted above, the RPR shall not be deemed to have usurped or exceeded the Engineer's authority or responsibilities, as set forth in the Agreement or the Contract Documents.
3. By taking any such action as noted above, the RPR shall not be deemed to have undertaken any of the responsibilities of the Contractor, Engineer, subcontractors, suppliers, or agents or employee's of same.
4. By taking any such action as noted above, the RPR shall not be deemed to have advised on, issued directions relative to, or assumed control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
5. By taking any such action as noted above, the RPR shall not be deemed to have provided advise on, or issued directions regarding, or assumed control over safety precautions and programs in connection with the Work.
6. The RPR shall not accept Shop Drawing or sample submittals from anyone other than CONTRACTOR.
7. By taking any such action as noted above, the RPR shall not be deemed to have authorized OWNER to occupy the Project in whole or in part.
8. Shall not participate in specialized field or laboratory tests or inspections conducted by others, except as specifically authorized by OWNER and ENGINEER.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, subject to written approval by Agency at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 - 1. deny the Claim in whole or in part,
 - 2. approve the Claim, or
 - 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise

may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressages, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.
- B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:
- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
 - 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

- a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
- b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 1. the Bid price of a particular item of Unit Price Work amounts to more than 5 percent of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. Contractor's Fee: The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.
 - g. Equipment: For any machinery or special equipment (other than small tools), including fuel and lubricant, the Contractor will receive 100% of the "Rental Rate Blue Book" for the actual time that such equipment is in operation on the work, and 50% of the "Rental Rate Blue Book" for the time the equipment is directed to standby and remain on the project site. The equipment rates will be based on the latest edition (version current at the time of bid) of the "Rental Rate Blue Book for Construction Equipment" or the "Rental Rate Blue Book for Older Construction Equipment," whichever is applicable, as published by Machinery Information Division of PRIMEDIA Information, Inc.(version current at the time of bid), using all instructions and adjustments contained therein and as modified below. On all projects, the Engineer will adjust the rates using regional adjustments and Rate Adjustment Tables according to the instructions in the "Blue Book".

- h. The Monthly Rate is the Basic Machine Rate Plus Any Attachments. Standby rates will apply when equipment is not in operation and is directed by the Engineer to standby at the project site when needed again to complete work and the cost of moving the equipment will exceed the accumulated standby cost. Standby rates will not apply on any day the equipment operates eight or more hours. Standby payment will be limited to only that number of hours which, when added to the operating time of that day equals eight hours. Standby payment will not be made on days that are not normally considered workdays on the project.
- i. The Owner will allow for the cost of transporting the equipment to and from the location at which it will be used. If the equipment requires assembly or disassembly for transport, the Owner will pay for the time to perform this work at the rate of standby equipment

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.B.
 - 1. delays caused by or within the control of Contractor; or
- D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval. Inspections required by the Contract Documents for pre-engineered, prefabricated or precast structural components shall be performed at the place of manufacture upon each stage of manufacture, by a registered professional engineer licensed in the State of Florida (other than the Manufacturer's Specialty Engineer) or a person under his direct supervision. Two (2) copies of a written report of such inspection shall be provided to the Engineer prior to delivery to the site and shall be prepared by the inspector and each copy shall bear the seal and signature of the respective registered professional engineer. The costs for these inspections and reports shall be paid for by the Contractor.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. Contractor shall have no claim for delay or disruption based upon the Engineer's reasonable actions under this paragraph.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others). Contractor shall have no claim for delay or disruption based upon the Engineer's reasonable actions under this paragraph.
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession

of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. Not later than ten (10) days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation indicating that the Contractor has either paid for such materials or equipment or warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner. The Contractor shall furnish evidence that payment received on the basis of materials and equipment not incorporated but delivered and suitably stored, has in fact been paid to the respective supplier(s) on submission of the next application for payment submitted by the Contractor. Failure to provide such evidence of payment shall result in the withdrawal of previous approval(s) and removal of the related equipment from the next submitted Application for Payment."
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

- 1. Not later than Twenty-five (25) days after the Application for Payment to the Owner is stamped as received by the City, the amount recommended by the Engineer, will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.
- 2. If the Contractor and its Surety shall fail to pay any undisputed claims, made in writing to Owner within thirty (30) days after completion of the Work, but continuing unsatisfied for a period of ninety (90) days, Owner, at its sole discretion and option, may pay such undisputed claim and deduct the amount thereof from the balance due Contractor; if Owner deems such action to be in its best interests. Owner may also, with the written consent of Contractor and its Surety, use any monies retained, due, or to become due under this Contract for the purpose of paying for both labor and materials for the Work, for disputed claims or claims that have not been filed.
- 3. All monies paid by Owner in settlement of claims as set forth above, with the costs and expenses incurred by Owner in connection therewith, shall be charged to Contractor, shall bear interest at the then existing legal rate of interest under the laws of the State of Florida; and shall be deducted from the next payment due Contractor under the terms of this Contract.

D. Reduction in Payment

- 1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. the Contractor's performance or furnishing of the Work is inconsistent with funding Agency requirements;
 - d. there are other items entitling Owner to a set-off against the amount recommended including but not limited to, the aggregation of liquidated damages; or
 - e. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
- 2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.
- 3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, supplies and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens. No materials or supplies for the Work shall be purchased subject to any security interest, or under a conditional sales contract or other agreement by which an interest is retained by the seller.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Agency, Contractor, and Engineer shall make a prefinal inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. In accordance with Florida Statutes Section §218.735, within 30 calendar days, or 45 days if over \$10 million construction cost, of reaching substantial completion of the construction services, the Owner and Contractor shall work together to develop the single list of items and the estimated cost to complete each item on the list required to render complete, satisfactory, and acceptable the construction services purchased by the Owner. See also General Conditions Section 710 of the bid package, and Section 5 of the Contract, Payment Procedures. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and

Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner, Agency, and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

4. Notwithstanding any other provision of these Contract Documents to the contrary, Owner and Engineer are under no duty or obligation whatsoever to any Subcontractor, laborer or other party to ensure that payments due and owing to any of them are or will be made. Such parties shall rely only on the Contractor's payment and performance bonds and the obligations of the Surety as remedy of nonpayment.

B. Engineer's Review of Application and Acceptance

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims. The remaining balance of any sum included in the final Application for Payment but held by OWNER for Work not fully completed and accepted will become due when the Work is fully completed and accepted.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05; however, if the Owner stops Work under Article 13.05 or suspends services under Article, or suspends the Work or any portion thereof because of the Contractor is endangering persons and property, the Contractor shall be entitled to no extension of Contract Time or increase in Contract Price.”

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
 - 1. Contractor’s persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04); or
 - 2. If the Contractor assigns or delegates its duties under this Contract or any substantial part thereof without the previous written consent of Owner, or if the Contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified; or
 - 3. Contractor’s disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor’s material disregard of the authority and directives of the Engineer; or
 - 5. Contractor’s violation or material breach of any provisions of the Contract Documents; or
 - 6. Contractor’s abandonment of the Work to be done under this Contract.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
 - 1. exclude Contractor from the Site, and take possession of the Work and of all Contractor’s tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),
 - 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and
 - 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION AND WAIVER OF TRIAL BY JURY

- 16.01 A. As a condition precedent to the filing of any suit or other legal proceeding, the parties shall endeavor to resolve claims, disputes or other matters in question by Mediation. Mediation shall be initiated by any party by serving a written request for same on the other party. The parties shall by mutual agreement select a Mediator within fifteen

(15) days of the date of the request for Mediation. If the parties cannot agree on the selection of a Mediator, then the owner shall select the Mediator, who, if selected solely by the Owner, shall be a Mediator certified by the Supreme Court of Florida. No suit or other legal proceeding shall be filed until the mediator declares an impasse, which declaration, in any event, shall be deemed as issued by the Mediator not later than sixty (60) days after the initial Mediation Conference. The CONTRACTOR will carry on the Work and maintain the progress schedule during any dispute. Venue for any litigation, at law or equity, shall lie exclusively in The Circuit Court of the Ninth Judicial Circuit Court in and for Orange County, Florida.

16.02 This Contract, or any provision hereof, shall be construed and interpreted, and any litigation arising therefrom, shall be governed by the laws of the State of Florida.

16.03 **The CONTRACTOR and OWNER waive trial by jury in any action, proceeding or claim which may be brought by either of the parties hereto against the other on any matters concerning or arising out of this Contract.**

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.
3. Both the address given in the Bid Form upon which this Agreement is founded, and Contractor's office at or near the site of the Work are hereby designated as places to either of which notices, letters, and other communications to Contractor shall be certified, mailed, or delivered. The delivering at the above named place, or depositing in a postpaid wrapper directed to the first-named place, in any post office box regularly maintained by the U.S. Postal Department, of any notice, letter or other communication to Contractor shall be deemed sufficient service thereof upon Contractor; and the date of said service shall be the date of such delivery or mailing. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor, and delivered to Owner and Engineer. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon Contractor personally.

17.02 Computation of Times

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 Cumulative Remedies

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

- 17.06 The form of all submittals, notices, change orders, and other documents permitted or required to be used or transmitted under the Contract Documents shall be determined by the Engineer. During the pre-construction meeting, the Engineer shall provide to the Contractor one set of such project administration forms to be utilized during the construction of this project. These forms are referenced as:

Forms Used by the Engineer and/or Owner's Representative

00844	Non-compliance Notice
00845	Field Order
00847	Request for Proposed Change
00848	Daily Construction Report
00849	Weekly Construction Progress Report

Forms Used by the Contractor

00861	Periodic Estimate for Partial Payment
00862	Certificate of Engineer
00863	Certificate of Final Completion
00864	Shop Drawing Submittal
00865	Certificate of Final Inspection
00868	Contractor Request for Information
00878	Contractor Proposed Change
00879	Waiver and Release of Lien upon Final Payment
00881	Waiver and Release of Lien upon Progress Payment
00883	Contractor's Final Affidavit
00885	Contractor's Interim Affidavit

Forms Used by All Parties during Construction

00850	Construction Accident Report
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- 17.07 The Contractor shall comply with Florida's Archives and Historical Act (Florida Statutes Chapter 267) and the regulations of the local historic preservation board as applicable and protect against the potential loss or destruction of significant, historical or archaeological data, sites, and properties in connection with the project.
- 17.08 If apprentices are required or utilized on this project, then the provisions of Chapter 446, Florida Statutes, shall govern.
- 17.09 If the price of this Agreement/Contract equals or exceeds \$50,000 and if the Contractor has 50 or more employees, the Contractor shall file with the Owner, within 30 calendar days after the award of this Agreement/Contract, a report on Standard Form 100 (EEO-1), which has been promulgated jointly by the Office of Federal Contract Compliance Programs, the Equal Employment Opportunity Commission, and Plans for Progress, unless the Contractor has submitted such a report within 12 months preceding the date of award of this Agreement/Contract. In addition, the Contractor shall ensure that each construction subcontractor having 50 or more employees and a lower-tier

construction subcontract with a price equaling or exceeding \$50,000 also files with the Owner, within 30 calendar days after the award to it of the lower-tier construction subcontract, a report on Standard Form 100 (EEO-1) unless the construction subcontractor has submitted such a report within 12 months preceding the date of award of the lower-tier construction subcontract. (Subsequent reports are to be submitted annually in accordance with 41 CFR 60-1.7(a) or at such other intervals as the Director of the Office of Federal Contract Compliance Programs may require.)

ARTICLE 18 – FEDERAL REQUIREMENTS

18.01 *Financing Agency Not a Party*

- A. This Contract may be funded in part with funds provided by a State or Federal Agency. Neither State or Federal Agency, nor any of its departments, entities, or employees is a party to this Contract. All procurements by Federal Grant recipients and sub-recipients shall comply with the provisions of 2 C.F.R. Section 200.317 – 327.

18.02 *Contract Approval*

- A. Owner and Contractor will furnish Owner's attorney such evidence as required so that Owner's attorney can complete and execute the following "Certificate of Owner's Attorney" (Exhibit GC-A) before Owner submits the executed Contract Documents to Agency for approval.
- B. Concurrence by Agency in the award of the Contract is required before the Contract is effective.

18.03 *Conflict of Interest*

- A. Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer.
- B. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in Contractor. Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

18.04 *Gratuities*

- A. If Owner finds after a notice and hearing that Contractor, or any of Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.
- B. In the event this Contract is terminated as provided in paragraph 18.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.

18.05 *Audit and Access to Records*

- A. For all negotiated contracts and negotiated modifications (except those of \$10,000 or less), Owner, Agency, the Comptroller General, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the Contractor, which are pertinent to the Contract, for the purpose of making audits,

examinations, excerpts and transcriptions. Contractor shall maintain all required records for three years after final payment is made and all other pending matters are closed.

18.06 *Small, Minority and Women's Businesses*

- A. If Contractor intends to let any subcontracts for a portion of the work, Contractor shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services. Affirmative steps shall consist of: (1) including qualified small, minority and women's businesses on solicitation lists; (2) assuring that small, minority and women's businesses are solicited whenever they are potential sources; (3) dividing total requirements when economically feasible, into small tasks or quantities to permit maximum participation of small, minority, and women's businesses; (4) establishing delivery schedules, where the requirements of the work permit, which will encourage participation by small, minority and women's businesses; (5) using the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce; (6) requiring each party to a subcontract to take the affirmative steps of this section; and (7) Contractor is encouraged to procure goods and services from labor surplus area firms.

18.07 *Anti-Kickback*

- A. Contractor shall comply with the Copeland Anti-Kickback Act (18 USC 874 and 40 USC 276c) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that Contractor or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. Owner shall report all suspected or reported violations to Agency.

18.08 *Clean Air and Pollution Control Acts*

- A. If this Contract exceeds \$100,000, Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 USC 7401 *et seq.*) and the Federal Water Pollution Control Act as amended (33 USC 1251 *et seq.*). Contractor will report violations to the Agency and the Regional Office of the EPA.

18.09 *State Energy Policy*

- A. Contractor shall comply with the Energy Policy and Conservation Act (P.L. 94-163). Mandatory standards and policies relating to energy efficiency, contained in any applicable State Energy Conservation Plan, shall be utilized.

18.10 *Equal Opportunity Requirements*

- A. If this Contract exceeds \$10,000, Contractor shall comply with Executive Order 11246, "Equal Employment Opportunity," as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."
- B. Contractor's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting Contractor's goals shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

- C. Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the Contract is to be performed.

18.11 *Restrictions on Lobbying*

- A. Contractor and each subcontractor shall comply with Restrictions on Lobbying (Public Law 101-121, Section 319) as supplemented by applicable Agency regulations. This Law applies to the recipients of contracts and subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. If applicable, Contractor must complete a certification form on lobbying activities related to a specific Federal loan or grant that is a funding source for this Contract. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 USC 1352. Each tier shall disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Certifications and disclosures are forwarded from tier to tier up to the Owner. Necessary certification and disclosure forms shall be provided by Owner.

18.12 *Environmental Requirements*

- A. When constructing a project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental constraints:
 - 1. Wetlands – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
 - 2. Floodplains – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100 year floodplain areas delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, i.e., alluvial soils on NRCS Soil Survey Maps.
 - 3. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact shall be immediately reported to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).
 - 4. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.

SECTION 01001
GENERAL WORK REQUIREMENTS

PART 1 - GENERAL	2
1.01 Notices	2
1.02 Work to be Done	2
1.03 Drawings and Project Manual	2
1.04 Protection and Restoration	3
1.05 Public Nuisance	4
1.06 Payment to Owner for Overtime Work	4
1.07 Maintenance of Service	5
1.08 Transfer of Service	5
1.09 Labor	5
1.10 Materials and Equipment	5
1.11 Manufacturer's Service	6
1.12 Inspection and Testing	6
1.13 Project Site and Access	9
1.14 Utilities	9
1.15 Related Construction Requirements	12
1.16 Construction Not Permitted	15
PART 2 - PRODUCTS (NOT USED)	15
PART 3 - EXECUTION (NOT USED)	15

SECTION 01001
GENERAL WORK REQUIREMENTS

PART 1 - GENERAL

1.01 Notices

- A. All notices or other papers required to be delivered by the Contractor to the Owner shall be delivered to the office of the City of Ocoee, Utilities Department, 1800 A. D. Mims Rd, Ocoee, FL 34761

1.02 Work to be Done

- A. The Contractor shall furnish all labor, materials, equipment, tools, services, and incidentals to complete all work required by these specifications and as shown on the Drawings, at a rate of progress which will ensure completion of the Work within the Contract Time stipulated.
- B. The Contractor shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, clean up, replacements, and restoration required as a result of damages caused during this construction.
- C. The Contractor shall comply with all City, County, State, Federal, and other codes, which are applicable to the proposed Work.
- D. All newly constructed Work shall be carefully protected from injury in any way. No wheeling, walking, or placing of heavy loads on it shall be allowed and all portions damaged shall be reconstructed by the Contractor at his own expense.
- E. Scope of Work: See Section 01100 "Summary of Work" and the Bid Schedule for details.

1.03 Drawings and Project Manual

- A. The Work shall be performed in accordance with the Drawings and Specifications prepared by the Owner/Engineer. All work and materials shall conform to these Specifications or Drawings.
- B. The Contractor shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications or other data received from the Owner/Engineer, and shall notify same, in writing, of all errors, omissions, conflicts and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction or improper operation resulting there from, nor from rectifying such conditions at his own expense.

- C. All schedules are given for the convenience of the Owner and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quantity of materials and equipment included in the Work to be done under this Contract.
- D. Intent:
 - 1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified either in the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the Contractor as though it were specifically delineated or described.
 - 2. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. Such items shall be provided by the Contractor in accordance with the detail required by the specifications or the Drawings.
 - 3. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

1.04 Protection and Restoration

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every means of protection necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or the Contractor shall make good the damage in other manner acceptable to the Owner/Engineer.
- B. Protection of Trees and Shrubs
 - 1. Protect with boxes or other barricades.
 - 2. Do not place excavated material so as to injure trees or shrubs.
 - 3. Install pipelines in short tunnels between and under root systems.
 - 4. Support trees to prevent root disturbance during nearby excavation.
- C. Tree and Limb Removal
 - 1. Tree limbs, which interfere with equipment operation and are approved for pruning, shall be neatly trimmed and the tree cut coated with tree paint.
 - 2. The Owner may order the Contractor, for the convenience of the Owner, to remove trees along the line or trench excavation. The Contractor shall obtain any permits required for removal of trees.
- D. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by the Contractor with new stock of similar size and age, at the proper season and at the sole expense of the Contractor.

- E. Lawn Areas: All lawn areas disturbed by construction shall be replaced with like kind to a condition similar or equal to that existing before construction. Where sod is to be removed, it shall be carefully removed, and the same re-sodded, or the area where sod has been removed shall be restored with new sod in the manner described in the applicable section.
- F. Where fencing, walls, shrubbery, grass strips or area must be removed or damaged incident to the construction operation, the Contractor shall, after completion of the work, replace or restore to the original condition.
- G. The cost of all labor, materials, equipment, and work for restoration shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefore, as part of the overhead cost of the Work, and no additional payment will be made therefore.

1.05 Public Nuisance

- A. The Contractor shall not create a public nuisance including, but not limited to, encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.
- B. Sound levels measured by the Owner/Engineer shall not exceed 45 dBA from 8 p.m. to 8 a.m. or 55 dBA 8 a.m. to 8 p.m. This sound level shall be measured at the exterior of the nearest exterior wall of the nearest residence. Levels at the equipment shall not exceed 85 dBA at any time. Sound levels in excess of these values are sufficient cause to have the Work halted until equipment can be quieted to these levels. Work stoppage by the Owner/Engineer for excessive noise shall not relieve the Contractor of the other portions of this specification including, but not limited to, completion dates and bid amounts.
- C. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

1.06 Payment to Owner for Overtime Work

- A. Owner Inspector Work Hours: Normal work hours for the Owner's inspector(s) are defined as any 8-hour period between the hours of 7:00 a.m. and 7:00 p.m. on the weekdays of Monday through Friday. Any Owner Inspector(s) work beyond the aforementioned normal work hours shall be requested in writing 48-hours in advance. All overtime, any Owner holidays or weekend work compensation for the Owner's Inspector(s) to work beyond the normal working hours are considered overtime compensation and shall be paid for by the Contractor. The Contractor agrees that the Owner shall deduct charges for work outside normal work hours and for overtime pay from payments due the Contractor.

1.07 Maintenance of Service

- A. Unless noted otherwise on the plans, the operation of the existing water, reclaimed water or wastewater facility at each of the respective locations shall remain in service until the transfer of service has been completed. The Contractor shall, prior to interrupting any utility service (water, sewer, etc.) for the purpose of making cut-ins to the existing lines or for any other purposes, contact the Owner and make arrangements for the interruption which will be satisfactory to the Owner.
- B. Utility lines that are damaged during construction shall be repaired by the Contractor and service restored within 4-hours of the breakage. The Owner retains the option of repairing any damage to utility pipes in order to expedite service to the customers. The Contractor will remain responsible for all costs associated with the repair.

1.08 Transfer of Service

- A. When the Owner has accepted a proposed facility and placed it into operation, the transfer of service is complete. The Contractor may begin the work of removing the existing or temporary facilities.

1.09 Labor

- A. Supervision: The Contractor shall supervise and direct the Work efficiently and with his best skills and attention. The Contractor shall have a competent, English speaking superintendent or representative, who shall be on the site of the Project at all working hours, and who shall have full authority by the Contractor to direct the performance of the Work and make arrangements for all necessary materials, equipment, and labor without delay.
- B. Jurisdictional Disputes: It shall be the responsibility of the Contractor to pay all costs that may be required to perform any of the Work shown on the Drawings or specified herein to avoid any work stoppages due to jurisdictional disputes.

1.10 Materials and Equipment

- A. Manufacturer
 - 1. All transactions with the manufacturers or Subcontractors shall be through the Contractor. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
 - 2. All workmanship and materials shall be of the highest quality. The equipment shall be the product of manufacturers who are experienced and skilled in the field with an established record of research and development. No equipment will be considered unless the manufacturer has designed and manufactured equipment of comparable type and size and have demonstrated sufficient experience in such design and manufacture.
 - 3. No material shall be delivered to the Site without prior approval of the Owner/Engineer.

4. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Project shall be the new (most current production at time of bid) and unused standard products of recognized reputable manufacturers.
5. Manufactured and fabricated products:
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - c. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.
 - d. Products shall be suitable for service conditions as specified and as stated by manufacturer.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
 - f. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.11 Manufacturer's Service

- A. Where service by the manufacturer is specified to be furnished as part of the cost of the item of equipment, the Work shall be at the Contractor's expense.
- B. The services provided shall be by a qualified manufacturer's service representative to check and verify the completed installation, place the equipment in operation, and instruct the Owner's operators in the operation and maintenance procedures. Such services are to be for period of time and for the number of trips specified. A working day is defined as a normal 8-hour working day on the job and does not include travel time.
- C. The services shall further demonstrate to the Owner/Engineer's complete satisfaction that the equipment will satisfactorily perform the functions for which it has been installed.

1.12 Inspection and Testing

- A. General
 1. All materials and equipment furnished by the Contractor shall be subject to the inspection, review and acceptance of the Owner and meet the requirements of the specifications and drawings. If in the testing of any material or equipment it is ascertained by the Owner/Engineer that the material or equipment does not comply with the Contract, the Contractor shall be notified thereof, and the Contractor will be directed to refrain from delivering said material or equipment, or to remove it promptly from the Site or from the Work and not accepted by the Owner shall be replaced with acceptable material, without cost to the Owner.
 2. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEE, except as may otherwise be stated herein.

3. The Contractor shall give notice in writing to the Owner sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Owner shall arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials; or the Owner will notify the Contractor that the inspection will be made at a point other than the point of manufacture; or the Owner will notify the Contractor that inspection will be waived.
4. When inspection is waived or when the Owner/Engineer so requires, the Contractor shall furnish to the Owner authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include five (5) copies of the results of physical tests and chemical analysis, where necessary, that have been made directly on the product or on similar products of the manufacturer.
5. The Contractor must comply with these provisions before shipping any material. Such inspections by the Owner shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

B. Cost

1. Owner shall employ and pay for the services of an independent testing laboratory to perform testing indicated on the Contract Documents, or at the Owner's discretion to ensure conformity with the Contract Documents (SEE SECTION 01450).
2. The cost of field leakage and pressure tests and shop tests of materials and equipment specifically called for in the Contract Documents shall be borne by the Contractor. Such costs shall be deemed to be included in the Contract price.
3. The Contractor shall notify the Owner laboratory a minimum of 48-hours in advance of operations for scheduling of tests. When tests or inspections cannot be performed after such notice, the Contractor shall reimburse Owner for expenses incurred.
4. The Contractor shall pay for all work required to uncover, remove, replace, retest, etc., any work not tested due to the Contractor's failure to provide the 48-hours advance notice or due to failed tests. The Contractor shall also provide compensation for the Owner/Engineer's personnel for required re-testing due to failed or rescheduled testing.

C. Shop Testing

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. No such equipment shall be shipped to the worksite until the Owner/Engineer notifies the Contractor, in writing, that the results of such tests are acceptable.

2. The manufacturing company shall provide five (5) copies of the manufacturer's actual shop test data and interpreted results signed by a responsible official of the manufacturing company and notarized, showing conformity with the Contract Documents as a prerequisite for the acceptance of any equipment. The cost of shop tests (excluding cost of Owner's representative) and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor and shall be included in the Contract price.

D. Field Testing:

1. The Owner shall employ and pay for services of an independent testing laboratory to perform testing specifically indicated in the Contract Documents. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract. The Contractor shall provide compensation for retesting of all failed tests.
2. The Owner may at any time during the progress of the Work, request additional testing beyond that which is specified in the Contract. This testing will be at the Owner's expense. Contractor shall:
 - a. Cooperate with laboratory personnel, provide access to the Project.
 - b. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.
 - c. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes, which require control by the testing laboratory.

- E. Demonstration Tests: Upon completion of the Work and prior to final payment, all equipment and piping installed under this Contract shall be subjected to acceptance or demonstration tests as specified or required to provide compliance with the Contract Documents. The Contractor shall furnish all labor, fuel, energy, water and all other equipment necessary for the demonstration tests at no additional cost to the Owner.

- F. Final Inspection: Prior to preparation of the final payment application, a final inspection will be performed by the Owner to determine if the Work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents. See also Section 01770 "Contract Closeout."

- G. Inspection by existing utility owners: The Contractor shall pay for all inspections during the progress of the work required and provided by the owner of all existing public utilities paralleling or crossing the Work, as shown on the Drawings. All such inspection fees shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefore, as part of the overhead cost of the Work, and no additional payment will be made therefore.

- H. Inspection by Other Agencies: The Florida Department of Transportation, the Florida Department of Environmental Protection, and other authorized governmental agencies, where applicable, shall have free access to the site for inspecting materials and work, and the Contractor shall afford them all necessary facilities and assistance for doing so. Any instructions to the Contractor resulting from these inspections shall be given through the Owner. These rights of inspections shall not be construed to create any contractual relationship between the Contractor and these agencies.

1.13 Project Site and Access

A. Right-of-Way and Easements

1. The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other traffic. Any earth or other excavated material shall be removed by the Contractor and the streets cleaned to the satisfaction of the Owner.
2. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the property owner.
3. At the time of the Pre-Construction meetings, the Contractor shall become fully acquainted with the status of all easements. Should easements not be acquired by the Owner in specific areas of the Work, the Contractor shall sequence and schedule his work therein so as not to interfere with the progress of work in other areas of the Project. Any rescheduling of work due to easement acquisitions shall be performed by the Contractor at no additional cost to the Owner. The Owner agrees that it will make every effort to acquire all remaining easements with all speed and diligence possible so as to allow the completion of the Work within the Contract time.

B. Access

1. Neither the material excavated nor the materials or equipment used in the construction of the Work shall be so placed as to prohibit free access to all fire hydrants, valves or manholes.
2. Access to businesses located adjacent to the project site must be maintained at all times. Contractor may prearrange the closing of business access with the business Owner. Such prearranged access closing shall not exceed two (2) hours. Property drainage and grading shall be restored and all construction debris removed within 48-hours of backfilling trench.
3. Contractor agrees that representatives of the Owner and any governmental agents will have access to the Work wherever it is in preparation or progress and that the Contractor shall provide facilities for such access and inspection.

1.14 Utilities

A. Utility Construction

1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto, whether owned or controlled by governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage or water. Other public or private property, which may be affected by the Work, shall be deemed included hereunder.
2. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required.

3. The length of open trench will be controlled by the particular surrounding conditions, but shall always be confined to the limits described by the Owner. If any excavation becomes a hazard, or if it excessively restricts traffic at any point, the Owner may require special construction procedures. As a minimum, the Contractor shall conform to the following restoration procedures:
 - a. Interim Restoration: All excavations shall be backfilled and compacted as specified by the end of each working day. For excavations within existing paved areas; limerock base or soil cement base (match existing) shall be spread and compacted to provide a relatively smooth surface free of loose aggregate material. At the end of each workweek, the S-I asphaltic surface course shall be completed and opened to traffic. Contractor shall coordinate his construction activity including density tests and inspections to allow sufficient time to achieve this requirement. All driveway cuts shall be backfilled, compacted, and limerock base spread and compacted immediately after installation. Contractor shall coordinate with the individual property owners prior to removing the driveway section. Any utility crossing an existing roadway, parking lot or other paved area shall be patched by the end of the working day.
 - b. All pipe and fittings shall be neatly stored in a location, which will cause the least disturbance to the public. All debris shall be removed and properly disposed of by the end of each working day.
 - c. Final Restoration Overlay: After completing all installations, and after testing of the pipe (but no sooner than 30-days after applying the S-I asphaltic surface), final restoration shall be performed. In no event shall final restoration begin after substantial completion. Final restoration shall provide an S-III asphaltic overlay as specified in an uninterrupted continuous operation until completion. Any additional restoration required after testing shall be repaired in a timely manner at no additional cost to the Owner.
 - d. Maintenance of all restored facilities shall be the Contractor's responsibility. This maintenance shall be performed on an on-going basis during the course of construction. The Contractor's Progress Schedule shall reflect the above restoration requirements.
 - e. Additional Restoration for Work in Business or Commercial Districts: The Contractor shall restore all private property, damaged by construction, to its original condition. Access to businesses located adjacent to the project site must be maintained at all times. Contractor may prearrange the closing of business accesses with the business owner. Such prearranged access closing shall not exceed two (2) hours. Property drainage and grading shall be restored within 24-hours of backfilling trench.

B. Existing Utilities

1. The locations of all existing underground piping, structures and other facilities are shown based on information received from the respective owner. The locations are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping, conduit and cables to be encountered. It is the Contractor's responsibility to verify all existing underground piping, structures and other facilities.

2. The Contractor shall, at all times, employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of existing utility installations and structures; and shall, at all times in the performance of the Work, avoid unnecessary interference with, or interruption of, utility services; and shall cooperate fully with the owners thereof to that end.
3. When existing facilities are found to be in conflict with the Work, the Owner reserves the right to modify alignments to avoid interference with existing facilities.
4. All utilities, which do not interfere with the work, shall be carefully protected against damage. Any existing utilities damaged in any way by the Contractor shall be restored or replaced by the Contractor at his expense as directed by the Owner. Any existing facilities, which require operation to facilitate repairs, shall be operated only by the owner of the respective utility.
5. It is the responsibility of the Contractor to ensure that all utility and/or poles, the stability of which may be endangered by the proximity of excavation, be temporarily stayed and/or shored in position while work proceeds in the vicinity of the pole and that the utility or other companies concerned be given reasonable advance notice of any such excavation.

C. Notices

1. All governmental utility departments and other owners of public utilities, which may be affected by the Work, will be informed in writing by the Contractor two (2) weeks after the execution of the Contract or Contracts covering the Work. Such notice will be sent out in general, and directed to the attention of the governmental utility departments and other owners of public utilities for such installations and structures as may be affected by the Work.
2. The Contractor shall comply with Florida Statute 553.851 regarding protection of underground gas pipelines. Evidence of notification to the gas pipeline owner shall be furnished to the Owner within two (2) weeks after the execution of the Contract.
3. It shall be the Contractor's responsibility to contact utility companies at least two (2) full business days in advance of breaking ground in any area, in accordance with Florida Statute 556, or on any unit of the work so maintenance personnel can locate and protect facilities, if required by the utility company.
4. The Contractor shall give a minimum five (5) working day notice to utility personnel prior to interrupting a utility service (water, sewer, etc.).

D. Exploratory Excavations

1. Exploratory excavations shall be conducted by the Contractor for the purpose of locating underground pipelines or structures in advance of the construction. Test pits shall be excavated in areas of potential conflicts between existing and proposed facilities and at piping connections to existing facilities a minimum of 48-hours or 1,000-feet in advance of work. If there is a potential conflict, the Contractor shall notify the Owner/Engineer immediately. Information on the obstruction to be furnished by the Contractor shall include: Location, Elevation, Utility Type, Material and Size. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Owner.

E. Utility Crossings

1. It is intended that wherever existing utilities must be crossed, deflection of the pipe within specified limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when in the opinion of the Owner this procedure is not feasible, the Owner may direct the use of fittings for a utility crossing or conflict transition as detailed on the Drawings.

F. Relocations

1. Relocations shown on the Drawings: Public utility installations or structures, including but not limited to poles, signs, fences, piping, conduits and drains that interfere with the positioning of the work which are shown on the Drawings to be removed, relocated, replaced or rebuilt by the Contractor shall be considered as part of the general cost of doing the Work and shall be included in the prices bid for the various contract items. No separate payment shall be made therefore.
2. Relocations not shown on the Drawings
 - a. Where public utility installations or structures are encountered during the course of the work, and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Owner, removal, relocation, replacement or rebuilding is necessary to complete the Work, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the Owner, for the Contractor to accomplish.
 - b. If such work is accomplished by the utility having jurisdiction, it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required.
 - c. If such work is accomplished by the Contractor, it will be paid for as a Change Order.
3. All existing castings, including valve boxes, junction boxes, manholes, hand holes, pull boxes, inlets and similar structures in the areas of construction that are to remain in service and in areas of trench restoration and pavement replacement, shall be adjusted by the Contractor to bring them flush with the surface of the finished work.
4. All existing utility systems which conflict with the construction of the work herein, which can be temporarily removed and replaced, shall be accomplished at the expense of the Contractor. Work shall be done by the utility unless the utility approves in writing that the Work may be done by the Contractor.

1.15 Related Construction Requirements

A. Traffic Maintenance

1. Contractor shall provide a traffic control plan. Include proposed signs, markings, barricades, detour routes, sequencing, and phasing for vehicular and pedestrian traffic routes during construction.
2. Prior to closing of any streets, the CONTRACTOR shall notify and obtain the approval of the CITY. Detours around construction will be subject to the approval of the CITY.

B. Barrier and Lights

1. The Contractor shall exercise extreme care in the conduct of the Work to protect health and safety of the workmen and the public. The Contractor shall provide all protective measures and devices necessary, in conformance with applicable local, state and federal regulations. Protective measures shall include but are not limited to barricades, warning lights/flashers and safety ropes.
2. All equipment and vehicles operating within 10-feet of the roadway shall have flashing strobe lights attached.

C. Dewatering and Flotation

1. The Contractor, with his own equipment, shall do all pumping necessary to dewater any part of the work area during construction operations to insure dry working conditions. The Contractor shall take the necessary steps to protect on-site and off-site structures. Damage to any structures due to dewatering shall be repaired or the structures replaced at the Contractor's expense.
2. The Contractor shall be completely responsible for any tanks, wetwells or similar structures that may become buoyant during the construction and modification operations due to the ground water or floods and before the structure is put into operation. The proposed final structures have been designed to account for buoyancy; however, the Contractor may employ methods, means and techniques during construction which may affect the buoyancy of structures. The Contractor shall take the necessary steps to protect structures. Damage to any structures due to floating or flooding shall be repaired or the structures replaced at the Contractor's expense.
3. Contractor shall be responsible for any required permits for the discharge of ground water.

D. Dust and Erosion Control

1. The Contractor shall prevent dust nuisance from his operations or from traffic.
2. Contractor is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.
3. Temporary erosion controls include, but are not limited to, grassing, mulching, netting, watering and reseeding on-site surfaces and soil and borrow area surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the Owner, FDEP and any other agency having jurisdiction.
4. Temporary sedimentation controls include, but are not limited to; silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the Owner, FDEP and any other agency having jurisdiction.
5. The construction of temporary erosion and sedimentation control facilities shall be in accordance with the technical provision of section 104 "Prevention, Control, and Abatement of Erosion and Water Pollution" of the FDOT Standard Specifications for Road and Bridge Construction, latest edition.

E. Lines and Grades

1. All Work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings, or as given by the Owner/Engineer.

2. When the location of the Work is dimensioned on the Drawings, it shall be installed in that location; when the location of the Work is shown on a scaled drawing, without dimensions, the Work shall be installed in the scaled location unless the Owner approves an alternate location for the piping. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve the Contractor from laying and jointing different or additional items where required. The Owner/Engineer may require detailed pipe laying drawings and schedules for project control.
3. The Contractor shall, at his own expense, establish all working or construction lines and grades as required from the project control points set by the Owner, and shall be solely responsible for the accuracy thereof.

F. Temporary Construction

1. Temporary fences: If, during the course of the Work, it is necessary to remove or disturb any fencing, the Contractor shall at his own expense, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced.
2. Responsibility for Temporary Structures: In accepting the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation.

G. Daily Reports

1. The Contractor shall submit to the Owner's Representative daily reports of construction activities including non-work days. The reports shall be complete in detail and shall include the following information:
 - a. Days from Notice to Proceed; Days remaining to substantial and final completion.
 - b. Weather information
 - c. Work activities with reference to the Critical Path Method (CPM) schedule activity numbers (including manpower, equipment and daily production quantities for each individual activity).
 - d. Major deliveries
 - e. Visitors to site
 - f. Test records
 - g. New problems, and
 - h. Other pertinent information
2. A similar report shall be submitted for/by each Subcontractor.
3. The report(s) shall be submitted to the Owner Representative within 2 days of the respective report date. Each report shall be signed by the Contractor's Superintendent or Project Manager. Pay request will not be processed unless daily reports are current.
4. If a report is incomplete, in error, or contains misinformation, a copy of the report shall be returned by the Owner Representative to the Contractor's Superintendent or Project Manager with corrections noted. When chronic errors or omissions occur, the Contractor shall correct the procedures by which the reports are produced.

H. Cleaning

1. During Construction

- a. During construction of the Work, the Contractor shall, at all times, keep the Site free from material, debris and rubbish as practicable and shall remove the same from any portion of the Site if, in the opinion of the Owner, such material, debris, or rubbish constitutes a nuisance or is objectionable.
- b. Provide on-site containers for the collection of waste materials, debris and rubbish and remove such from the Site periodically by disposal at a legal disposal area away from the Site.
- c. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished. Use cleaning materials which will not create hazards to health or property and which will not damage surfaces. Use only those cleaning materials and methods recommended by the manufacturer of the surface material. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.
- d. The Contractor shall remove from the site all surplus materials and temporary structures when no longer necessary to the Work at the direction of the Owner.

2. Final Cleaning

- a. At the conclusion of the Work, all equipment, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and the Contractor shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances. Employ skilled workmen for final cleaning. Thoroughly clean all installed equipment and materials to a bright, clean, polished and new appearing condition. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- b. The Work shall be left in a condition as shown on the Drawings and the remainder of the site shall be restored to a condition equal or better than what existed before the Work.
- c. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of interior and exterior surfaces, and all work areas to verify that the entire Work is clean. The Owner will determine if the final cleaning is acceptable.

1.16 Construction Not Permitted

A. Use of Explosives

1. No blasting shall be done except as approved by the Owner and the governmental agency having jurisdiction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.01 Referenced Standards

Any reference to published specifications or standards of any organization or association shall comply with the requirements of the specification or standard which is current on the date of Advertisement for Bids. In case of conflict between the referenced specifications or standards, the one having the more stringent requirements shall govern.

In case of conflict between the referenced specifications or standards and the Contract Documents, the Contract Documents shall govern.

1.02 Abbreviations

AA	-	Aluminum Association
AADF	-	Annual Average Daily Flow
AASHTO or	-	American Association of State Highway
AASHO		and Transportation Officials
ABPA	-	Acoustical and Board Products Association
ACI	-	American Concrete Institute
AGA	-	American Gas Association
AGMA	-	American Gear Manufacturers Association
AI	-	The Asphalt Institute
AIA	-	American Institute of Architects
AIEE	-	American Institute of Electrical Engineers
AIMA	-	Acoustical and Insulating Materials Association
AISC	-	American Institute of Steel Construction
AISI	-	American Iron and Steel Institute
ANSI	-	American National Standards Institute
API	-	American Petroleum Institute
APWA	-	American Public Works Association
AREA	-	American Railway Engineering Association
ASA	-	American Standards Association (ANSI)
ASCE	-	American Society of Civil Engineers
ASME	-	American Society of Mechanical Engineers
ASSCBC	-	American Standard Safety Code for Building Construction
ASTM	-	American Society for Testing and Materials
AWA	-	American Welding Association
AWPA	-	American Wood Preservers Association
AWPB	-	American Wood Preservers Bureau
AWS	-	American Welding Society
AWWA	-	American Water Works Association
CCC	-	Chlorine Contact Chamber
CL	-	Centerline
CSI	-	Concrete Reinforcing Steel Institute

CS	-	Commercial Standard
DIP	-	Ductile Iron Pipe
DIA	-	Diameter
DOT Spec	-	Standard Specification for Road and Bridge Construction, Florida Dept. of Transportation, latest revision
DR	-	Draw
E/A	-	Engineer or Architect
EL	-	Elevation
FE	-	Filtered Effluent
FDEP	-	Florida Department of Environmental Protection
FS	-	Federal Standard
GPM	-	Gallons per Minute
GST	-	Ground Storage Tank
HP	-	Horsepower
HWL	-	High Water Level
ID	-	Inside Diameter
IEEE	-	Institute of Electrical and Electronic Engineers
IEX	-	Ion-Exchange
IPCEA	-	Insulated Power Cable Engineers Association
MG	-	Million Gallons
MDF	-	Maximum Daily Flow
MH	-	Manhole
NBFU	-	National Board of Fire Underwriters
NBS	-	National Bureau of Standards
NEC	-	National Electrical Code
NECA	-	National Electrical Contractors' Association
NEMA	-	National Electrical Manufacturers' Association
NFPA	-	National Fire Protection Association
NPT	-	National Pipe Threads
NSF	-	National Sanitation Foundation
NWL	-	Normal Water Level
OD	-	Outside Diameter
OSHA	-	U.S. Dept. of Labor, Occupational Safety and Health Association
PCA	-	Portland Cement Association
PCI	-	Prestressed Concrete Association
PS	-	United States Product Standard
PHF	-	Peak Hourly Flow
PSIG	-	Pounds per Square Inch Gauge
PVC	-	Poly Vinyl Chloride
RPM	-	Revolutions per Minute
SAE	-	Society of Automotive Engineers
SDI	-	Steel Decks Institute
SE	-	Secondary Effluent
SJI	-	Steel Joists Institute
SMACNA	-	Sheet Metal and Air Conditioning Contractors' National Association
SSPC	-	Structural Steel Painting Council
STA	-	Station (100')
TDH	-	Total Dynamic Head
UL	-	Underwriters' Laboratories, Inc.

USASI or	-	United States of America Standards
USAS	-	Institute (now ANSI)
WTP	-	Water Treatment Plant
WWTF	-	Wastewater Treatment Facility

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01110

SUMMARY OF WORK

PART 1 - GENERAL

1.01 Section Includes

Summary of work, other contracts, work sequence, operation of existing facilities, use of premises, Owner furnished products, coordination, cutting and patching

1.02 Summary of Work

- A. The project will consist of, but is not limited to, the following:
 - i. Construct one (1) Electrical Building and furnish and install new electrical equipment
 - ii. Install new 1000 KW generator with weatherproof sound-attenuating walk-in type enclosure and belly tank (generator, automatic transfer switches, and fuel monitoring system to be provided by the City)
 - iii. Construct blower pad and install new blowers (blowers to be provided by the City)
 - iv. Demolish existing generator, diesel fuel tank, transformer, sidewalk and aboveground blower piping
 - v. Furnish and install electrical conduit and electrical pullboxes.
 - vi. Construct generator pad, grade site and install new concrete sidewalk.
 - vii. Construct transformer pad per Duke Energy Specifications
 - viii. Remove existing asphalt pavement and replace with concrete pavement
- B. Furnish all materials, equipment, tools, and labor which is reasonably and properly inferable and necessary for the proper completion of the Work, whether specifically indicated in the Contract Documents or not.
- C. All permits, licenses and fees, other than those permits included in the appendices shall be secured and paid for by the CONTRACTOR.
- D. Repair, replace, or otherwise settle with the Owner, if damage to property or existing facilities occurs, including damage to pavements, utilities, lawns, structures, etc.
- E. Construct the Project under a single lump sum contract.

1.03 Work Under Other Contracts –N/A

1.04 Work Sequence

Contractor's sequence of work may be of his choosing in order to complete the work in the allowed time frame while accommodating other contractors on site.

1.05 Operation of Existing Facilities

Owner shall be able to operate existing facilities 24 hours per day, 7 days per week.

1.06 Contractor Use of Premises

Confine operations at the site to areas permitted by applicable laws, ordinances, permits, and by the Contract Documents. Do not unreasonably encumber the site with materials or equipment. Do not load structures with weight that will endanger the structure. Contractor shall assume full responsibility for protection and safekeeping of products stored on the job site.

1.07 Owner Furnished Products

- A. One (1) New 1000 KW Generator with Automatic Transfer Switches and Fuel Monitoring System
- A. Two (2) New Blowers

1.08 Coordination

- A. Contractor shall be fully responsible for the coordination of his work and the work of his employees, subcontractors, and suppliers and to assure compliance with schedules.
- B. Coordination requirements of this Section are in addition to the requirements of Section 00700, General Conditions, and 00800, Supplementary Conditions.
- C. Contractor is responsible for coordinating with all the utilities regarding locates, testing, or relocations.

1.09 Cutting and Patching

- A. Contractor shall, at no additional expense to the Owner, perform cutting and patching necessary to the completion of the Project. Perform cutting and patching in a manner to prevent damage to the structure or previously completed work.
- B. Refinish surfaces as necessary to provide an even finish.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.01 Description

Work Specified Herein and Elsewhere

- A. Work under this Section includes:
 - 1. Preconstruction meeting
 - 2. Coordination meetings
- B. Related work specified elsewhere:
 - 1. Submittals - Section 01300

1.02 Requirements Included

- A. The ENGINEER shall schedule and administer preconstruction meeting, periodic progress meetings, and specially called meetings throughout the progress of the work.
 - 1. Prepare agenda for meetings.
 - 2. Coordinate physical arrangements for meetings.
 - 3. Preside at meetings.
 - 4. Prepare minutes of meetings.
- B. Representatives of contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The CONTRACTOR shall attend meeting to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.03 Preconstruction Meeting

- A. The OWNER OR AUTHORIZED REPRESENTATIVE will schedule a preconstruction meeting prior to beginning the work. This meeting shall be attended by the Engineer, the CONTRACTOR, and the OWNER. The purpose of the meeting shall be to review shop drawing procedures, construction methods, and to establish a construction schedule.
- B. Location: A central site, convenient for all parties designated by the OWNER OR AUTHORIZED REPRESENTATIVE.

- C. Attendance:
 - 1. OWNER's Representative
 - 2. ENGINEER and his professional consultants
 - 3. Resident Project Representative
 - 4. CONTRACTOR's Superintendent.
 - 5. Major Subcontractors.
 - 6. Major Suppliers.
 - 7. Utilities.
 - 8. Others as appropriate.

- D. Suggested Agenda:
 - 1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected construction schedules.
 - 2. Critical work sequencing.
 - 3. Major equipment deliveries and priorities including list of long lead time items and anticipated delivery dates.
 - 4. Project Coordination.
 - 5. Designation of responsible personnel.
 - 6. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Applications for payment.
 - 7. Adequacy of distribution of Contract Documents.
 - 8. Procedures for maintaining record documents.
 - 9. Use of Premises:
 - a. Office, work and storage areas.
 - b. OWNER's requirements.
 - 10. Construction facilities, controls and construction aids.
 - 11. Construction Sequencing to minimize plant down time.
 - 12. Housekeeping procedures.
 - 13. Check of required Bond and Insurance certifications.
 - 14. Liquidated Damages.
 - 15. Request for a weekly job meeting for all involved.
 - 16. Equal Opportunity Requirements.
 - 17. Laboratory testing of material requirements.
 - 18. Inventory of material stored on-site provisions.

1.04 Progress Meetings

- A. Schedule regular periodic meetings. The progress meetings will be held every 30 days or less with the first meeting 30 days after the preconstruction meeting or 30 days or less after the date of Notice to Proceed.

- B. Hold called meetings as required by progress of the work.

- C. Location of the meetings: Project field office of CONTRACTOR or ENGINEER or as designated by the OWNER.
- D. Attendance:
 - 1. ENGINEER, and his professional consultants as needed.
 - 2. Subcontractors as appropriate to agenda.
 - 3. Suppliers as appropriate to the agenda.
 - 4. Others as appropriate.
- E. Suggested Agenda:
 - 1. Review, approval of minutes of previous meeting.
 - 2. Review of work progress since previous meeting.
 - 3. Field observations, problems, conflicts.
 - 4. Problems which impede construction schedule.
 - 5. Review of off-site fabrication, delivery schedules.
 - 6. Corrective measures and procedures to regain projected schedule.
 - 7. Revisions to construction schedule.
 - 8. Progress, schedule during succeeding work period.
 - 9. Coordination of schedules.
 - 10. Review submittal schedules; expedite as required.
 - 11. Maintenance of quality standards.
 - 12. Pending changes and substitutions.
 - 13. Review proposed changes for:
 - a. Effect on construction schedule and on completion date.
 - b. Effect on other contracts of the Project.
 - 14. Other business.
 - 15. Construction schedule.
 - 16. Critical/long lead times.
- F. The CONTRACTOR is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of the work, etc.
- G. The CONTRACTOR is to provide a current submittal log at each progress meeting in accordance with Section 01300.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 Section Includes

Measurement and payment provisions, schedule of values

1.02 General Measurement and Payment Provisions

- A. Payment for all work done in compliance with the Contract Documents, inclusive of furnishing all manpower, equipment, materials, and performance of all operations relative to construction of this project, will be made as a lump sum which will be complete payment for all work called for or reasonably inferable from the Contract Documents and other work will be considered incidental to the Contract and no additional compensation will be allowed.
- B. The Owner reserves the right to alter the Drawings, modify incidental work as may be necessary, and increase or decrease the work to be performed to accord with such changes, including deductions or additions to the scope of work outlined in the Contract Documents. Changes in the work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof. Changes resulting in changes in the scope or quantities of Work or time or other conditions of work will be basis for consideration of a Change Order which is to be negotiated and executed before proceeding with the work. A supplemental agreement between the Contractor and the Owner will be required when such changes meet the conditions described in the Supplementary Conditions. Work which has not been authorized by a written Change Order will not be subsequently considered for additional payment.
- C. The Contractor shall take no advantage of any apparent error or omission in the Drawings or Specifications, and the Engineer shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.
- D. If the Contractor makes a claim for an extra or additional cost and requests a Change Order be issued prior to performing the work, and the ENGINEER and/or OWNER renders a decision denying such request, the CONTRACTOR must notify the Engineer in writing within 3 days of the time that the CONTRACTOR is informed of the Engineer's decision. Otherwise the Owner will not consider any such difference as a claim for a Change Order or additional payment or time. Any such written notice received by the Engineer from the Contractor within the 3 day period shall be just reason for the Engineer to re-evaluate his previous decision.

- E. Failure on the part of the Contractor to construct any item to plan or authorized dimensions within the specification tolerances shall result in: reconstruction to acceptable tolerances at no additional cost to the Owner; acceptance at no pay; or, acceptance at reduced price, all at the discretion of the Engineer.
- F. Work shall not be considered complete until all testing has been satisfactorily completed and the item of work has demonstrated compliance with plans and specifications.
- G. A preliminary monthly application for payment shall be submitted to the Owner/Engineer for review five (5) days prior to the submittal for approval of the Contractor's monthly payment request.

1.03 Schedule of Values

- A. Submit Schedule of Values for approval prior to commencing construction. As a minimum, include those values reported on the Bid Form. The Schedule of Values shall be the basis for making payment applications and establishing prices for Change Orders.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 Description

Work Specified Herein and Elsewhere

This Section includes but is not limited to requirements for the following:

1. Construction Schedules.
2. Shop Drawings, Product Data, and Samples.
3. Record Documents.
4. Operation and Maintenance Manuals.

PART 2 - SCHEDULES AND REPORTS

2.01 Schedule of Operations

Submit a schedule of operations to the Engineer for approval prior to any construction operations. The construction operations shall be sequenced to provide a minimum of interruption to operation of the existing facilities. Inform the Engineer of any changes in the schedule and allow ample time for the OWNER to alter operations as required by the construction of the various components of the work. Approval of traffic control and schedules shall be obtained from the governmental entity having jurisdiction over the area of work.

PART 3 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3.01 Shop Drawings

- A. Shop Drawings are original drawings, prepared by the CONTRACTOR, a subcontractor, or distributor, which illustrate some portion of the work; showing fabrication, layout setting, or erection details.
- B. Shop drawings shall be prepared by a qualified detailer and shall be identified by reference to sheet and detail numbers on the Contract Documents. Reproductions for submittal shall be full size opaque diazo prints or other print acceptable to the Engineer. Reduced size prints will not be reviewed or approved.

3.02 Product Data

- A. Product data are manufacturer's standard schematic drawings and manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.

- B. Standard drawings shall be modified to delete information which is not applicable to the project and supplemented to provide additional information applicable to the project.
- C. Catalog sheets, brochures, etc., shall be clearly marked to identify pertinent materials, products, or models.

3.03 Samples

Samples are physical examples to illustrate materials, equipment, or workmanship and to establish standards by which work is to be evaluated.

3.04 CONTRACTOR's Responsibilities

- A. Prior to submission, the CONTRACTOR shall thoroughly check shop drawings, product data, and samples for completeness and for compliance with the Contract Documents and shall verify all dimensions and field conditions and shall coordinate the shop drawings with the requirements for other related work.
- B. CONTRACTOR is responsible for errors and omissions in submittals is not relieved by the Engineer's review of submittals.
- C. CONTRACTOR shall notify the Engineer, in writing, at the time of submission, of deviations in submittals from the requirements of the Contract Documents and is not relieved by the Engineer's review of submittals, unless the Engineer gives written acceptance of specific deviations.
- D. Begin no work which requires submittals until return of submittals with Engineer stamp and initials or signature indicating the submittal has been reviewed.

3.05 Submission Requirements and Engineer Review

- A. Submit one (1) electronic copy or six (6) copies of product data. Submit the number of samples indicated in the individual Specifications Section.
- B. Shop drawings, product data, samples and certifications shall be submitted by the CONTRACTOR to the Engineer. Submittals should be properly identified with the name of the project, dated, and each lot submitted shall be accompanied by a letter of transmittal referring to the name of the project and to the specification page number and/or Drawing number for identification of each item. Submittals for each type of work shall be numbered consecutively, and the numbering system shall be retained throughout all revisions.

- C. Submittals shall bear the CONTRACTOR's stamp of approval certifying that they have been checked. Submittals without the CONTRACTOR's initialed or signed certification stamp and submittals which, in the Engineer's opinion, are incomplete, contain numerous errors or have not been properly checked, will be returned unchecked by the Engineer for resubmission. The CONTRACTOR shall mark his corrections in Green ink and the ENGINEER's comments shall be noted in Red.
- D. ENGINEER will review submittals with reasonable promptness. The Engineer's review of submittals shall not be construed as a complete check and shall not relieve the CONTRACTOR from responsibility for complete compliance with the Contract requirements. No corrections, changes or deviations indicated on submittals reviewed by the ENGINEER shall be considered as a change order.
- E. If submittal is acceptable, the ENGINEER will retain one (1) electronic copy or three (3) sets of prints and return the remaining prints to the CONTRACTOR. If the submittal is not satisfactory, one set of prints will be retained by the ENGINEER and the remaining prints returned to the CONTRACTOR for appropriate action.
- F. In the event a third submittal of shop drawings is required, due to previous submittals of incomplete or incorrect shop drawings not in accordance with the Drawings and Specifications, the CONTRACTOR will be charged one-half the cost incurred by the ENGINEER for the review of the third submittal. The CONTRACTOR shall bear the total cost incurred by the ENGINEER for all subsequent reviews. The ENGINEER costs charged to the CONTRACTOR will be at the cost plus rate generally charged by the ENGINEER and will be deducted by the OWNER from payments due the CONTRACTOR.
- G. Distribution of copies of acceptable submittals will be as mutually determined by the CONTRACTOR, OWNER and ENGINEER on an individual item basis during or following the preconstruction conference.

PART 4 - RECORD DOCUMENTS

4.01 General

- A. As the work progresses, the CONTRACTOR shall mark on a set of Contract Documents all changes from the Contract Documents.
- B. Mark on the Contract Documents all changes in direction and location of structures, piping, equipment, electrical, and mechanical work.
- C. Mark on the Specifications the manufacturer, trade name, catalog, and supplier of each product actually installed, and mark changes made by change order or field order.

- D. Following installation of the water system improvements and prior to system testing, the CONTRACTOR shall provide to the OWNER, Preliminary As-Built Drawings showing any deviations to the improvements from the approved and permitted plans. This set of drawings will be utilized for preparation of the drawings to be used for clearance of the system improvements through PCDOH/FDEP. The Final As-Built Drawing as outlined below will also be required to be submitted.
- E. At the completion of the Work, the CONTRACTOR shall submit As-Built Drawings signed and sealed by a licensed surveyor registered in the State of Florida. The as-built drawings shall include locations of all located items to a minimum of two permanent references and information is to include, but not be limited to, the following:
 - 1. Location of all valves, fittings, connection points, etc.
 - 2. All utility and storm structure top and invert elevations.
 - 3. Distance along pipelines between structures.
 - 4. Stormwater conveyance systems including dimensions, elevations, contours, and cross sections.
 - 5. Pavement centerline and edge of pavement elevations every 200 feet plus at all curb inlet locations.
 - 6. Utility pipeline tied horizontally to edge of pavement and right-of-way lines, located every 200-ft plus all changes in horizontal offset.
 - 7. Horizontal and vertical data for any construction that deviates from the approved engineering drawings.

PART 5 - OPERATION AND MAINTENANCE MANUALS

5.01 Submittal Requirements

- A. The CONTRACTOR shall be responsible for obtaining installation, operation, and maintenance manuals from the manufacturers and suppliers. Submit one (1) electronic pdf copy and four (4) hard copies of manuals (plus additional copies to be returned to the Contractor) to the ENGINEER within 30 days after approval of shop drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the project site. All operation and maintenance manuals shall be submitted prior to the completion of 35% of the construction.
- B. Manuals shall be provided for each piece of equipment including individual components and subsystems of complete assemblies. The section of the manual on operation shall describe the function of each component and its relationship to the system of which it is a part. Where several models, options, or styles are described, the manual shall identify the items actually provided.
- C. The manual shall contain the following:
 - 1. Table of contents/index
 - 2. Specific description of each system and components

3. Manufacturer's identification, including order number, model, and serial number
 4. Name, address, telephone number(s) and e-mail address(es) of vendor(s) and local service representative(s)
 5. Specific on-site operating instructions (including starting and stopping procedures)
 6. Safety considerations
 7. Project specific operational procedures
 8. Project specific maintenance procedures
 9. MANUFACTURER's operating and maintenance instructions – specific to the project
 10. Copy of each wiring diagram
 11. Copy of CONTRACTOR's approved shop drawings
 12. List of spare parts and recommended quantities
 13. Product Data: Mark each sheet to clearly identify specific products and component parts and data applicable to installation. Delete inapplicable information.
 14. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams
 15. Provide logical sequence of instructions for each procedure, incorporating MANUFACTURER's instructions specified.
 16. Equipment attributes sheet for submittal of name plate data.
 17. Warranties and Bonds.
- D. Each manual shall be bound in a binder and labeled to identify the contents, specification section, and project to which it applies.
- E. Operation and maintenance manuals specified herein are in addition to any operation, maintenance, or installation instructions by the CONTRACTOR to install, test, and start up equipment.
- F. Manuals for Equipment and Systems - In addition to the requirements listed above, for each System, provide the following:
1. Overview of system and description of unit or system and component parts. Identify function, normal operating characteristics and limiting conditions. Include performance curves, with engineering data and tests and complete nomenclature and commercial number of replaceable parts.
 2. Panelboard circuit directories including electrical service characteristics, controls and communications and color coded wiring diagrams as installed.

3. Operating procedures: include start-up, break-in and routine normal operating instructions and sequences; regulation, control, stopping, shut-down and emergency instructions; and summer, winter and any special operating instructions.
4. Maintenance Requirements:
 - a. Procedures and guides for trouble-shooting; disassembly, repair, and reassembly instructions
 - b. Alignment, adjusting, balancing and checking instructions
 - c. Servicing and lubrication schedule and list of recommended lubricants
 - d. MANUFACTURER's printed operation and maintenance instructions
 - e. Sequence of operation by instrumentation and controls manufacturer
 - f. Original MANUFACTURER's parts list, illustrations, assembly drawings and diagrams required for maintenance
5. Control diagrams by controls manufacturer as installed (as-built)
6. CONTRACTOR's coordination drawings, with color coded piping diagrams, as installed (as- built)
7. Charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams. Include equipment and instrument tag numbers on diagrams.
8. List of original MANUFACTURER's spare parts and recommended quantities to be maintained in storage
9. Test and balancing reports, as required
10. Additional Requirements as specified in individual product specification
11. Design data for systems engineered by the CONTRACTOR or its Suppliers
12. Equipment attribute Information

Equipment Attribute Worksheet shall be provided for all equipment meeting the asset definition as follows:

Asset Definition

- Maintenance is recommended
- Assets have a value greater than \$1,000
- Assets are complete and usable, and perform a distinct function independently (i.e., they pump waste, remove solids, etc.)

- a. This asset definition is intended to give a general indication of which equipment must be included in the Equipment Attribute Worksheets. The ENGINEER will provide the specific list of equipment that the CONTRACTOR must provide information for.
 - b. The data requirements include nameplate data, manufacturer and supplier information, information specific to the type of equipment, and recommended preventative maintenance activities.
 - c. An electronic copy of the Equipment Attribute Worksheets must be delivered in Excel format and submitted to the ENGINEER on CD-ROM and submitted with the O&M manuals. It is not necessary to submit printed copies of the Equipment Attribute Worksheets.
- G. Manual for Materials and Finishes – In addition to the requirements listed above, for each material or finish, provide the following:
 1. Building Products, Applied Materials and Finishes: Include product data, with catalog number, size, composition and color and texture designations. Provide information for re-ordering custom manufactured products.
 2. Instructions for Care and Maintenance: Include MANUFACTURER's recommendations for cleaning agents and methods, precautions against detrimental agents and methods and recommended schedule for cleaning and maintenance.
 3. Moisture Protection and Weather Exposed Products: Include product data listing, applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance and repair.
- H. Quick Reference Sheets for Equipment
 1. For each item of equipment provide the following:
 - a. A minimum of one 8 ½ x 11-inch laminated quick reference sheet. Sheets shall be three hole punched and may be double sided.
 - b. Each quick reference sheet shall include the following minimum information:
 - 1) Safety Procedures:
 - a. Brief descriptions of each piece of equipment and components
 - b. Starting and stopping procedures
 - c. Special operating instruction
 - d. Routine maintenance procedures
 - e. Calibration procedures

- f. Pump curves
 - g. Trouble shooting procedures
 - h. Name, address, and telephone numbers of local service representative
- c. Provide three copies of quick reference sheets for review by the ENGINEER.
- d. After quick reference sheets have been approved, provide four copies of laminated quick reference sheets to the ENGINEER in one commercial coiled three-ring binder with durable and cleanable plastic cover.

END OF SECTION

SECTION 01301

PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.01 Summary

A. General

1. Base all bids on materials and equipment shown on the drawings and listed in the specifications.
2. Certain types of equipment and kinds of material are described in specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers.
 - a. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are "or-equals," as determined by Owner/Engineer.
3. Other types of equipment and kinds of material may be acceptable substitutions under the following conditions:
 - a. Or-equals are unavailable due to strike, discontinued production of products meeting specified requirements, or other factors beyond control of Contractor; or,
 - b. Contractor proposes a cost and/or time reduction incentive to the Owner.

1.02 Quality Assurance

A. In making request for substitution or in using an approved product, Contractor:

1. Has investigated proposed product, and has determined that it is adequate or superior in all respects to that specified, and that it will perform the function for which it is intended.
2. Will provide same guarantee for substitute item as for product specified.
3. Waives all claims for additional costs related to substitution which subsequently arise.

1.03 Definitions

- ###### **A. Product: Manufactured material or equipment.**

1.04 Procedure for Requesting Substitution

A. Substitution shall be considered only:

1. After award of Contract
2. Under the conditions stated herein

- ###### **B. Written request through Contractor only.**

- C. Transmittal Mechanics
 - 1. Follow the transmittal mechanics prescribed for Shop Drawings in Specification Section 01300 "Submittals."
 - a. Product substitution will include in the transmittal letter, either directly or as a clearly marked attachment, the items listed in Paragraph D below.
- D. Transmittal Contents
 - 1. Product identification:
 - a. Manufacturer's name
 - b. Telephone number and representative contact name
 - c. Specification Section or Drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents.
 - 2. Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents.
 - 3. Itemized comparison of original and proposed product addressing product characteristics including but not necessarily limited to:
 - a. Size
 - b. Composition or materials of construction
 - c. Weight
 - d. Electrical or mechanical requirements
 - 4. Product experience
 - a. Location of past projects utilizing product.
 - b. Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product.
 - c. Available field data and reports associated with proposed product.
 - 5. Data relating to changes in construction schedule.
 - 6. Data relating to changes in cost.
 - 7. Samples
 - a. At request of Owner/Engineer.
 - b. Full size if requested by Owner/Engineer.
 - c. Held until substantial completion.
 - d. Owner/Engineer is not responsible for loss or damage to samples.

1.05 Approval or Rejection

- A. Written approval or rejection of substitution to be given by the Engineer.
- B. Engineer reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.
- C. In the event the substitution is approved, the resulting cost and/or time reduction will be documented by Change Order in accordance with the General Conditions.
- D. Substitution will be rejected if:
 - 1. Submittal is not through the Contractor with his stamp of approval.
 - 2. Request is not made in accordance with this Specification Section.
 - 3. In the Owner/Engineer's opinion, acceptance will require substantial revision of the original design.

4. In the Owner/Engineer's opinion, substitution will not perform adequately the function consistent with the design intent.
- E. Contractor shall reimburse the Owner for the cost of the evaluation whether or not substitution is approved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01310

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 Section Includes

Meetings, construction progress documentation, submittals.

1.02 Related Sections

- A. Section 01320 – Project Completion Schedule
- B. Section 01780 - Record Drawings

1.03 Preconstruction Meeting

The Owner will schedule a preconstruction meeting prior to beginning the Work to review shop drawing procedures, submittal requirements, and construction administration requirements (project coordination and communication). The Contractor shall bring to the preconstruction meeting the proposed construction schedule, which will be reviewed with the Owner during the meeting.

1.04 Definitions

- A. Shop Drawings - Shop drawings are original drawings, prepared by the Contractor, a subcontractor, supplier, or distributor, which illustrate some portion of the Work; showing fabrication, layout, setting, or erection details. Shop drawings shall be prepared by a qualified detailer and shall be identified by reference to sheet and detail numbers on the Contract Drawings
- B. Product Data - Product data are manufacturer's standard schematic drawings and manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data. Catalog sheets, brochures, etc., shall be clearly marked to identify pertinent materials, products, or models.
- C. Samples - Samples are physical examples to illustrate materials, equipment, or workmanship and to establish standards by which work is to be evaluated.

1.05 Submittal Requirements

- A. Prior to submission, thoroughly check shop drawings, product data, and samples for completeness and for compliance with the Contract Documents. Verify all field measurements, quantities, dimensions, specified performance criteria, fabrication, shipping, handling, storage, assembly, installation, and safety requirements.

- B. Coordinate the submittals with the requirements for other related work.
- C. Notify the Engineer, in writing at the time of submission, of deviations in submittals from the requirements of the Contract Documents. The Contractor's responsibility for deviations in submittals from the requirements of the Contract Documents is not relieved by the Engineer's review of submittals, unless the Engineer gives written acceptance of specific deviations.
- D. Submit electronic copies (PDF format) of each shop drawing and product data.
- E. Where a specific product manufacturer and model number is listed in individual specification sections and is proposed by the Contractor to be used, full submittal of product data is not required. In this case, submit in letter format the name of the product, manufacturer, model number, specification section, and name of project. Certify the identified product is proposed to be used in the project.
- F. Shop drawings, product data, and samples shall be accompanied by a letter of transmittal referring to the name of the project and to the specification page number and/or Drawing number for identification of each item. Submittals for each type of work shall be numbered consecutively, and the numbering system shall be retained throughout all revisions.
- G. Submittals shall bear the Contractor's stamp of approval certifying that they have been checked and indicate appropriate specification section and/or drawing location. Submittals without the Contractor's initialed or signed certification stamp and submittals which, in the Engineer's opinion, are incomplete, contain numerous errors or have not been properly checked, will be returned unchecked by the Engineer for resubmission.
- H. Begin no work which requires submittals until return of submittals with Engineer stamp and printed name or signature indicating the submittal has been approved.

1.06 Engineer Review of Submittals

- A. Engineer's review and approval of submittals will not extend to means, methods, techniques, sequences, procedures of construction or to safety precautions.
- B. The review and approval of a separate item will not indicate approval of the assembly in which the item functions. Engineer's review and approval of submittals shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents.
- C. The Engineer will review submittals with reasonable promptness. The Engineer's review of submittals shall not be construed as a complete check and shall not relieve the Contractor from responsibility for complete compliance with the Contract requirements.
- D. No corrections, changes, or deviations indicated on submittals reviewed by the Engineer shall be considered as a change order.

- E. Where review of submittals is required by the Owner or other agencies, the Engineer will forward the appropriate submittal(s) to these parties after Engineer review. Once review of all parties is complete, the submittal(s) will be returned to the Contractor reflecting the review of all parties
- F. If the submittal is not satisfactory, one copy of the submitted item will be retained by the Engineer and all other copies returned to the Contractor for appropriate action.
- G. In the event a third submittal is required, due to previous submittals of incomplete or incorrect data or not in compliance with the Contract Documents, the Contractor will be charged one-half of the cost incurred by the Engineer for the review of the third submittal. The Contractor shall bear the total cost incurred by the Engineer for all subsequent reviews. The Engineer costs charged to the Contractor will be at the cost plus rate generally charged by the Engineer and will be deducted by the Owner from payments due to the Contractor.
- H. Distribution of copies of acceptable submittals will be as mutually determined by the Contractor, Owner, and Engineer during or following the preconstruction conference.

1.07 Progress Meetings

- A. The frequency of progress meetings shall be determined during the preconstruction meeting. As a minimum, progress meetings shall be held once per month during construction.
- B. The Contractor and Owner shall attend the progress meetings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01315

PRECONSTRUCTION VIDEO

PART 1 - GENERAL

1.01 Description

- A. Provide continuous color audio and video recording along the entire length of all proposed work areas prior to construction to serve as a record of pre-construction conditions.
- B. Supplement audio and video recording with digital color photographs for areas which require details not ascertainable on the recorded video.

1.02 Related Requirements

- A. Section 01310 – Administrative Requirements.

1.03 Definitions

Construction Area = All areas used for construction of the proposed improvements, temporary construction, stockpile areas, staging and storage areas, and entry and exit points used by equipment, delivery vehicles, service vehicles, and other vehicles used for transport of labor, equipment, and materials to the job site.

1.04 Qualifications

The preconstruction audio-video recording shall be of professional quality that will clearly log an accurate visual description of existing conditions. Any portion of the digital recording that is determined by the Owner or Engineer to be not acceptable in the documentation of the existing condition shall be re-filmed at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 General

- A. The total video recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project.
- B. The digital recording equipment shall capture existing conditions as an individual movie file (.MP4, .MPG, .WMV, .MOV or approved equal). The files shall be saved in digital format on a portable USB hard/flash drive or approved equal. The files shall be able to be played back on any Windows compatible computer.
- C. The video shall be recorded in real time and the date and time of the recording shall be displayed on the video.

- D. The video file names shall be referenced in the recording report generated in PDF format. The report shall identify locations of where the video was recorded and the time location on the video at each recording location.
- E. The digital portion of the recording shall produce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of picture imperfection.
- F. The audio portion of the recording shall produce the commentary of the camera operator with proper volume, clarity, and be free from distortion.

2.02 Audio-Video Recording

- A. Each audio-video recording shall be saved on appropriate USB "Thumb Drive" media viewable through a standard USB port on a computer.
- B. Each USB "Thumb Drive" shall contain the following information and arrangement at the beginning as a title screen:
 City of Ocoee, Florida
 PROJECT NAME
 PROJECT NUMBER
 CONTRACTOR: (Name of Contractor)
 DATE: (When photo was taken)
 VIDEO BY: (Firm Name of Videographer)
 LOCATION: (Description of Location(s) and View(s))
- C. Each USB "Thumb Drive" recording section shall begin with an audio description of the Owner's name, Contract name and number, Contractor's name, date and location information such as street name, direction of travel, viewing side, etc.
- D. Information appearing on the video recording must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.
- E. Digital information to appear in the upper left corner shall be as follows:
 - 1. Name of Contractor
 - 2. Day, date and time
 - 3. Name of Project & Specification Number
- F. Time must be accurate and continuously displayed on the video record
- G. Written documentation must coincide with the information on the USB "Thumb Drive" so as to make easy retrieval of locations at a later date.
- H. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photographic negatives.

- I. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary shall be given for unusual conditions of buildings, sidewalks and curbing, foundations, trees and shrubbery, structures, equipment, pavement, etc.
- J. All USB "Thumb Drive" and boxes shall bear labels with the following information:
 - 1. USB "Thumb Drive" Number
 - 2. Owner's Name
 - 3. Date of Recording
 - 4. Project Name and Number
 - 5. Location and Standing Limit of Video

PART 3 - EXECUTION

3.01 General

- A. The recordings shall contain coverage of all surface features located within the construction area and extend outward a minimum of 30-ft outside the construction area plus all off road access routes used to reach the construction area. The recording shall include all surface conditions supported by appropriate audio description.
- B. The surface features documented in the recordings shall include, but not be limited to, all driveways, sidewalk, curb, gutter, buildings, walls, storage sheds, swales, culverts, headwalls, landscaping, trees, shrubbery, pull boxes, valve boxes, concrete pads, power poles, guy wires, mailboxes, and fences.
- C. The recordings shall also document the existence or nonexistence of any faults, fractures, or defects, and existing man made material such as debris, construction stockpiles, trash, and fuel containers.
- D. Each video recording shall be a simultaneous recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the feature being shown in the video portion of the recording. The audio recording also shall be free from any conversations between the camera operator and any other production technicians.
- E. Each video shall have a log of that video's contents. The log shall describe the various segments of coverage contained on that video in terms of the names of streets or easements, coverage beginning and end, directions of coverage, and video unit counter numbers.

3.02 Recording Schedule

- A. The recording shall be performed prior to the placement of any construction materials or equipment on the proposed construction site. Coordinate the scheduling of the preconstruction video recording with the Owner.

- B. The Contractor shall coordinate the video recording with the construction schedule so that those portions of the construction that will be completed first will be recorded first.
- C. Off road access routes to and from the construction area shall be recorded prior to mobilizing to work areas.
- D. The Contractor shall deliver the video recordings to the Owner upon their completion.

3.03 Visibility

All recordings shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist, or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subject, and to produce bright, sharp video recordings of those subjects. No recording shall be performed when more than 10% of the area to be recorded contains debris or obstructions unless otherwise authorized by the Engineer.

3.04 Continuity of Coverage

- A. In order to increase the continuity of the coverage, the coverage shall consist of a single, continuous, unedited recording which begins at one end of a particular construction area. However, where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, such coverage shall consist of an organized, interrelated sequence of recordings at various positions along that proposed construction area.
- B. The average rate of travel during a particular segment of coverage (e.g., coverage of one side of the street) shall be directly proportional to the number, size, and value of the surface features within that construction area's zone of influence.

3.05 Camera Height and Stability

When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall not be more than 10 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will not cause any unsteady picture.

3.06 Camera Control

Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video playback. In addition, all other camera and recording system controls, such as lens, focus, and aperture, video level, pedestal, chroma, white balance, and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.

3.07 Viewer Orientation Techniques

The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views and visual displays of all visible house and building addresses shall be utilized. In easements where the proposed construction location will not be readily apparent in the recorded video, highly visible yellow flags shall be placed in such a fashion as to clearly indicate the proposed centerline of construction.

3.08 Areas to be Video Recorded

- A. When video recording on private property, the Contractor shall give the Owner sufficient prior notice of such entry so that property owners may be advised of, and their permission obtained for, the Work.
- B. All video recording shall be done during regular business hours, unless otherwise specified by the property owner or the Owner. The Contractor shall enter and leave property in a professional and orderly, workmanlike manner.

END OF SECTION

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SECTION 01320

PROJECT COMPLETION SCHEDULE

PART 1 - GENERAL

1.01 Section Includes

Project completion scheduling

1.02 Submittals

- A. Prior to construction, prepare a schedule showing all major activities needed to complete project. Include major material and equipment order and delivery times. Submit to Owner no later than the date of the preconstruction conference.
- B. Schedule to utilize Critical Path Method formatted by establishing a precedence diagram which is time scaled. Include on schedule activity start dates, stop dates, and duration; critical path; float; delivery schedules. Include submittal dates and durations for components with extended lead times in schedule.
- C. Include on the schedule a minimum float of 1 day every 3 weeks during construction.
- D. Project substantial and final completion dates shown on schedule shall be same as or earlier than the contractual dates.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 Monitoring and Updating of Schedule

- A. Float shown on the schedule belongs to the project.
- B. Progress data shall be accumulated to update the schedule on a monthly basis, prior to submittal of the application for payment. Progress data shall include:
 - 1. Activities started
 - 2. Activities completed.
 - 3. Predicted activity starts
 - 4. Predicted activity completions
 - 5. Changes in original duration for specific activities
 - 6. Changes in activity sequences
 - 7. Percent complete on activities
- C. Update of schedule to include effect of the progress projected for the next two (2) reporting periods.

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SECTION 01450
QUALITY CONTROL

PART 1 - GENERAL

1.01 Section Includes

Quality control, quality assurance

1.02 Quality Control

- A. It is the Contractor's responsibility to perform all work in conformance with the Plans and Specifications. In order to fulfill this responsibility, the Contractor is required to have an approved Quality Control Program, including testing, as part of his Contract work in accordance with the Contract Documents and to submit details of his Program to the Engineer for review and approval prior to commencing any construction operations. The submittal shall include detailed information on locations and number of all tests, etc., that will be necessary for the Contractor to make his own determination that the work is being performed in compliance with the Project requirements.
- B. As part of the Contractor's Quality Control Program included as part of his work, the Contractor shall employ and pay for an independent, approved soils testing laboratory to perform testing services outlined in these Contract Documents.
- C. The Contractor's Quality Control Program shall include, but not be limited to, the following in addition to the type and frequency of tests as required by the technical specifications:
 - 1. Piping and structural excavation, bedding and backfill materials and density quality control testing
 - 2. Determination of compactive effort needed for compliance with the density requirements.
 - 3. Portland cement concrete and asphalt paving quality control testing including design mix review, materials, field slump and air content, and field and lab cured strength samples and testing.
- D. In addition to Quality Control Testing, the Contractor shall be responsible for required testing or approvals for any work (or any part thereof) if laws or regulations of any public body having jurisdiction specifically require testing, inspections or approval. The Contractor shall pay all costs in connection therewith and shall furnish the Engineer the required certificates of inspection, testing or approval. The Contractor shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with Owner or Engineer acceptance of a supplier of materials or equipment proposed to be incorporated into the work.

- E. Any design or testing laboratory utilized by the Contractor shall be an independent laboratory acceptable to the Owner and the Engineer, approved in writing, and complying with the latest edition of the "Recommended Requirements for Independent Laboratory Qualification", published by the American Council of Independent Laboratories.
- F. Testing laboratories, whether provided by the Contractor, shall promptly notify the Engineer and the Contractor of irregularities or deficiencies of work that are observed during performance of services. Laboratories shall submit two (2) copies of all reports directly to the Engineer and two (2) copies to the Contractor.

1.03 Quality Assurance

- A. In addition to the services provided by the laboratory paid for by the Contractor as a part of his work, the Owner, at his sole discretion, may employ an additional independent soils laboratory as part of Owner's Quality Assurance Program to verify that the work meets the requirements of the Contract Documents. The Owner furnished Quality Assurance testing may include the type and frequency of tests as required by the technical specifications. The Owner reserves the right to have additional tests made beyond those specified in the Contract Documents. The Contractor shall cooperate with the Owner and make the work and samples available for Owner testing at no additional cost in case the Owner chooses to have additional Owner furnished testing performed. It is the sole responsibility of the Contractor to see that his work meets all provisions of the Contract Documents.
- B. The Contractor shall cooperate with the soils laboratory personnel and provide access to the work to be tested. The Contractor shall notify the Engineer and Owner's testing laboratory sufficiently in advance of operations to allow scheduling of tests. The Contractor shall furnish casual labor and facilities to obtain and handle samples at the site and to store and cure test samples as required.

1.04 Testing of Materials

- A. Unless otherwise specified, all materials shall be sampled and tested in accordance with the latest published standard methods of ASTM in effect at the time bids are received.
- B. Test of materials shall be made by a representative of the Contractor, unless otherwise provided. Testing of equipment shall be the responsibility of the Contractor or an authorized manufacturer's representative. All test results shall be furnished to the Engineer in writing. The Contractor shall provide facilities required to collect and forward samples. The Contractor shall furnish the required samples without charge.
- C. The Contractor shall not make use of or incorporate in the work, the materials represented by the sample until tests have been made and the material found to be in accordance with the requirements of the Specifications.

- D. Materials to be tested and the applicable test procedure shall be as outlined in the individual sections of these Specifications.

1.05 Source and Quality of Materials and Equipment

- A. The source of materials to be used shall be in accordance with the Contract Documents and as approved by the Engineer before delivery. The approval of the source of any material shall continue as long as the material conforms to the Specifications.
- B. All material not conforming to the requirements of the Specifications shall be considered as defective and shall be removed from the work. If in place, faulty materials shall be removed by the Contractor at his expense and replaced with acceptable material unless permitted otherwise by the Owner. No defective materials that have been subsequently corrected shall be reused until approval has been given.
- C. Upon failure of the Contractor to comply immediately with any order of the Engineer to remove and replace defective material, the Owner shall have authority to remove and replace defective materials, and to deduct the cost of removal and replacement from any monies due or to become due to the Contractor. Failure to reject any defective materials or work at the time of installation shall in no way prevent later rejection when such defects are discovered, nor obligate the Owner to final acceptance.

1.06 Additional Testing

In addition to soils laboratory and materials testing, the Contractor shall perform other testing called for in the Contract Documents including but not limited to piping, pressure, leakage, infiltration and exfiltration, as required.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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SECTION 01520

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 Section Includes

Construction facilities, controls, temporary utilities, project identification signs, field office and storage sheds, storage of materials and equipment.

1.02 Submittals

- A. Prior to installation of construction facilities and temporary controls, submit the following items for review and approval:
 - 1. Site Utilization Plan
 - 2. Project identification sign. Provide proposed text, layout, and sizing of all required signs.

1.03 Construction Facilities and Temporary Controls

All construction facilities and temporary controls remain the property of the Contractor establishing them and shall be maintained in a safe and useful condition until removed from the construction site.

1.04 Removal of Temporary Construction

Remove the various temporary facilities, services, and controls and legally dispose of them as soon as the Owner deems permissible. Portions of the site and areas used for temporary facilities shall be restored to existing or better condition, including but not limited to fill replacement, regrading, compaction, and sodding.

1.05 Transportation and Handling

- A. Manufactured materials and products shall be delivered to the project site as needed for installation, undamaged, in original packages, containers, or bundles, as packaged by the manufacturer with manufacturer's name, brand, seals, and labels intact.
- B. Materials other than those designated within the Specifications or approved by the Owner shall not be delivered to the project site.

1.06 Storage and Protection

- A. The Contractor shall be responsible for protection and preservation of all materials until final acceptance of the Project. Any damage to work prior to acceptance shall be remedied by the Contractor at no additional cost to the Owner.

- B. Provide temporary weather-tight enclosures to protect work from damage by the elements, and protect finished surfaces to prevent any damage resulting from the work of any trade.

1.07 Security

- A. Contractor shall, at all times, be responsible for the security required in all project areas and shall provide all reasonable protection to prevent damage, injury or loss to employees on the Work and all other persons who may be affected thereby; all the work materials and equipment to be incorporated therein, whether in storage on or off the project site, under the care, custody or control of the Contractor or any subcontractors; and any other property under the care, custody or control of the Contractor or any subcontractors. Contractor shall be responsible for such security and safety until final acceptance of the Work.
- B. Full time watchmen will not be specifically required as a part of the Contract, but the Contractor shall provide inspection of work area daily and shall take whatever measures are necessary to protect the safety of the public, workmen, and materials, and provide for the security of the site, both day and night.

PART 2 - PRODUCTS

2.01 Temporary Electric Service

- A. Furnish and maintain temporary lighting and power required to perform the Work. Include in the Bid all costs for providing temporary electrical service.
- B. Temporary service shall include protective enclosures, branch wiring, outlets, lamps, and grounding as required by NEC and Local Electrical Codes.

2.02 Temporary Heating

The Contractor shall furnish fuel or power and provide and operate all temporary heating units. Heat shall be provided as necessary to perform the Work. Temporary heating units shall be adequately vented and approved devices which will not damage finished areas. The Contractor shall also furnish all tarpaulins and temporary enclosures necessary to provide this protection.

2.03 Temporary Ventilation

The Contractor shall provide, operate, and furnish power for temporary ventilation required for the proper installation and curing of materials and safety of workmen.

2.04 Temporary Water

- A. Provide a temporary water distribution system for all construction purposes and pay for all water used. Obtain temporary meters from the local water utility as required and pay all associated fees.

- B. Furnish potable drinking water in suitable dispensers and with cups for use of all employees at the job.
- C. Provide all temporary piping, hoses, etc., required to transport water to the point of usage by all trades.

2.05 Temporary Sanitary Facilities

Provide temporary toilet facilities as required. Maintain these during the entire period of construction under this Contract for the use of all construction personnel on the job. Enough chemical toilets shall be provided to conveniently serve the needs of all personnel. Chemical toilets and their maintenance shall meet the requirements of State and local health regulations and ordinances.

2.06 Temporary Pumping and Site Drainage

Keep the site free from water at all times to permit continuous access and to prevent damage to the work.

2.07 Material Hoists and Cranes

- A. Provide material hoists required for normal use by all trades and employ skilled hoist operators. Provide all necessary guards, signals, safety devices, etc., required for safe hoist operation. The construction and operation of material hoists shall be in accordance with the applicable ANSI Standards, the "Manual Code of Accident Prevention in Construction" of the Associated General Contractors of America, OSHA, and of other Federal, State, and municipal codes or ordinances. The Contractor shall prohibit the use of hoists for transporting personnel. Hoists shall be located to avoid risk of damage to completed work.
- B. Special rigging and hoisting facilities shall be provided by each trade requiring their use.

2.08 Temporary Runways, Scaffolding, and Ladders

- A. Provide temporary ladders, ramps, and runways as required for performance and inspection of the work. The above facilities shall be constructed and maintained in accordance with the applicable Federal, State, and Municipal regulations and codes.
- B. Furnish, erect, and maintain all scaffolding required for this work. Scaffolding shall be constructed and maintained in accordance with applicable State and Federal laws and local ordinances. Scaffolding shall be promptly removed after serving its purpose.
- C. The structural strength and safety of scaffolding, runways, covers, railings, ladders, stairs, etc., and compliance with law shall be the sole responsibility of the Contractor.

2.09 Temporary Chutes

No materials shall be dropped from structures except through enclosed wooden or metal chutes which shall be provided and maintained as required for the performance of the work by the various trades.

2.10 Project Identification Sign

- A. As soon as practicable after award of contract, but no later than twenty (20) days after the Notice to Proceed is issued, furnish and erect one sign for the project, placed at a location determined by Owner. The sign shall be erected when the work is started and shall be suitably supported, braced, and maintained, and shall be removed upon completion of the project or when directed by the Owner.
- B. The sign shall comply with the latest SRF signage requirements. The sign shall contain text including the following:

(Name of Owner) City of Ocoee

(Name of Project) WWTF Electrical Upgrade and Expansion

Engineer: CPH, LLC

Contractor: _____

- C. Submit to the Owner for approval the proposed sign lettering (fonts, size) and text prior to fabricating the signs.
- D. No other signs will be permitted.

2.11 Contractor's Field Office and Storage Sheds

The Contractor shall provide field office and storage sheds that it determines are required for the performance of the Work and protection of materials and equipment.

2.12 Owner / Engineer Field Office – N/A

- A. The Contractor shall provide for the Owner/Engineer a separate construction trailer, for the Owner's or Engineer's use during the construction contract. This trailer will serve as a field office and shall contain:
 - 1. 2 desks with high back chair on coasters
 - 2. 2 30" x 60" tables
 - 3. 8 folding chairs
 - 4. 1 ABC fire extinguisher (minimum 10 lb. rated capacity)
 - 5. 2 wastebaskets - office type
 - 6. 1 telephone line (including monthly fee)
 - 7. 1 bottle type water cooler (including monthly service)
 - 8. Keys to the trailer

- B. The Contractor shall not only provide and pay for the trailer(s), but shall also provide and pay for the telephone lines and their monthly bills, lavatory supplies, monthly electric bill, weekly service of the septic tank, water hook up, connection fees, once per week cleaning of the trailers, plus all associated bills and fees for the trailer and its contents. The mobile office trailer and exterior stairs shall meet all Federal, State, and local laws and shall comply with Health Department regulations. In lieu of the septic tank, the trailer can be hooked up to existing sewer lines, if available; however, Contractor is responsible for all hook ups and service payments as applicable.

PART 3 - EXECUTION

3.01 Access Roads and Parking Areas

- A. Construct temporary roadways and parking areas within the site as required to provide proper access to the site for delivery of material and equipment of all trades. It is up the Contractor to determine whether it needs to construct any temporary roads or parking areas to accommodate its construction (including delivery of materials, equipment, and manpower to the site).
- B. At completion of the work or when directed by the Owner, surfacing and sub-base material used for the temporary road and parking areas shall be removed, unless otherwise approved by the Owner.

END OF SECTION

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SECTION 01610

DELIVERY, STORAGE, AND HANDLING

PART 1 - GENERAL

1.01 Description

- A. This Section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the Work.
- B. Deliver, handle and store products in accordance with manufacturer's recommendations and by methods and means that will prevent damage, deterioration, and loss including theft and protect against damage from climatic conditions. Control delivery schedules to minimize long-term storage of products at the site and overcrowding of construction spaces. In particular, provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss. Damaged or defective items, in the opinion of the Owner, will be replaced at no cost to the Owner.

1.02 Requirements

- A. The Contractor is responsible for all material, equipment and supplies purchased and delivered to the Owner under this Contract until final inspection of the Work and acceptance thereof by the Owner.
- B. All materials and equipment to be incorporated in the Work will be handled and stored by the Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.
- C. All materials and equipment, which in the opinion of the Owner, have become so damaged as to be unfit for the use intended or specified, will be promptly removed from the site of the Work, and the Contractor will receive no compensation for the damaged materials or equipment or for its removal.
- D. In the event any such material, equipment and supplies are lost, stolen, damaged or destroyed prior to final inspection and acceptance, the Contractor will replace same without additional cost to the Owner.

1.03 Delivery

- A. Transport and handle items in accordance with manufacturer's instructions.
- B. The Owner and the Contractor's project superintendent must be on-site to accept all deliveries shipped directly to the job site. If the project superintendent is not present for a delivery, that delivery may be rejected by the Owner. If any delivery is rejected due to

non-availability of the Contractor's project superintendent, delivery shall be rescheduled at no additional cost to the Owner.

- C. Schedule delivery to reduce long-term on-site storage prior to installation and/or operation. Under no circumstances will materials or equipment be delivered to the site more than 1-month prior to installation without written authorization from the Owner.
- D. Coordinate deliveries in order to avoid delay in, or impediment of, the progress of the Work.
- E. Schedule deliveries to the site not more than 1-month prior to scheduled installation without written authorization from the Owner.
- F. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- G. All items delivered to the site will be unloaded and placed in a manner that will not hamper the Contractor's normal construction operation or those of Subcontractors and other Contractors and will not interfere with the flow of necessary traffic.
- H. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible. Maintain packaged materials with seals unbroken and labels intact until time of use.
- I. Immediately on delivery, inspect shipments with the Owner to ensure compliance with requirements of Contract Documents and accepted submittals, and that products are properly protected and undamaged. If the Contractor does not notify the Owner regarding the delivery and the Owner rejects any part of the delivery, there will be no additional cost to the Owner for the material to be returned. For items furnished by others (i.e. Owner), perform inspection in the presence of the Owner. Provide written notification to the Owner of any problems.
- J. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

1.04 Storage and Handling

- A. Provide equipment and personnel to handle products by methods recommended by the manufacturer to prevent soiling or damage to products or packaging, with seals and labels intact and legible.
- B. The Contractor is responsible for securing a location for on-site storage of all material and equipment necessary for completion of the Work. The location and storage layout will be submitted to the Owner at the Pre-Construction conference.
- C. Manufacturer's storage instructions will be carefully studied by the Contractor and reviewed with the Owner. These instructions will be carefully followed and a written record of this kept by the Contractor.

- D. All material delivered to the job site will be protected from dirt, dust, dampness, water, and any other condition detrimental to the life of the material from the date of delivery to the time of installation of the material and acceptance by the Owner.
- E. When required or recommended by the manufacturer, the Contractor will furnish a covered, weather protected storage structure providing a clean, dry, non-corrosive environment for all mechanical equipment valves, architectural items, electrical and instrumentation equipment, and special equipment to be incorporated into this Project.
- F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and free from damage or deterioration.
- G. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract within 7-days after written notice to do so has been given, the Owner retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost associated with these corrections from the Contract Amount. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

1.05 Specific Storage and Handling

(Additional specific storage and handling requirements may be found in the specification sections addressing the material requirements.)

- A. All mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) will be stored in a weather tight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Owner. The building will be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.
 - 1. All equipment will be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer. Mechanical equipment to be used in the Work, if stored for longer than 90-days, will have the bearings cleaned, flushed and lubricated prior to testing and startup, at no extra cost to the Owner.
 - 2. Moving parts will be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the Contractor will start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
 - 3. Lubricants will be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants will be put into the equipment at the time of acceptance. Prior to acceptance of the equipment, the Contractor will have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer will be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment will be judged to be

- defective. It will be removed and replaced at the Contractor's expense.
4. Electric motors provided with heaters will be temporarily wired for continuous heating during storage. Upon installation of the equipment, the Contractor will start the equipment, at least half load, and once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
- B. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
 - C. Cement and lime will be stored under a roof and off the ground and will be kept completely dry at all times.
 - D. Brick, block and similar masonry products will be handled and stored in a manner to minimize breakage, chipping, cracking and spilling to a minimum.
 - E. Precast Concrete will be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking.
 - F. All structural and miscellaneous steel and reinforcing steel will be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams will be stored with the webs vertical.
 - G. Metals will be stored dry, all under cover and vented to prevent build-up of humidity, all off ground to provide air circulation.
 - H. Lumber will be stacked to provide air circulation. Store materials for which maximum moisture content is specified in an area where moisture content can be maintained.
 - I. Gypsum wallboard systems will be stored to protect all metal studs, furring, insulation boards, batts, accessories and gypsum board to prevent any type of damage to these materials. Rusted material components, damp or wet insulation or gypsum boards will not be accepted.
 - J. Acoustical materials will be delivered to the job site in unbroken containers labeled and clearly marked. Materials will not be removed from containers until ready to install, but will be stored in dry area with cartons neatly stacked. Before installation, acoustical board will be stored for not less than 24-hours in the Work area at the same temperature and relative humidity.
 - K. Linear items will be stored in dry area with spacers to provide ventilation. Stack linear items to prevent warping, complying with manufacturer's instructions.
 - L. Paints and other volatile materials will be stored within approved safety containers. No glass jugs will be permitted. Storage areas will be equipped with not less than 2 fire extinguishers (CO2 type) sufficient to discharge a distance of 25-feet when fully charged and have current tags. No other building materials will be stored in this area. Used rags will be removed daily. Clean rags will be stored in metal closed containers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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SECTION 01730

OPERATION AND MAINTENANCE MANUAL

PART 1 - GENERAL

1.01 Requirements Included

- A. Section includes the submittal process for the operation and maintenance manual and the manual shall contain the technical information required for proper installation, operation and maintenance of process, electrical and mechanical equipment and systems.
- B. The requirements of this Section are separate, distinct and in addition to product submittal requirements that may be established by other Sections of the Specifications. Owner's manuals, manufacturer's printed instructions, parts lists, test data and other submittals required by other Sections of the Specifications may be included in the Operating and Maintenance Manuals provided that they are approved and are formatted in a manner consistent with the requirements of this Section.

1.02 Submittal Schedule

- A. Operation and Maintenance Manual Schedule
- B. The Contractor will submit the proposed format, content and tab structure for all Operating and Maintenance Manuals for the Owner's review and approval. The tab structure for Operating and Maintenance Manuals will follow specification division format as accepted by the Construction Specification Institute.
- C. Initial submittal within 60-days after date Shop Drawings are approved.

1.03 Preparation of Submittals

- A. General:
Operating and Maintenance Manual documents must include, but are not limited to, table of contents, approved submittals, manufacturer's operating and maintenance instructions, brochures, Shop Drawings, performance curves and data sheets annotated to indicate equipment actually furnished (e.g. identifying impeller size, model, horsepower, etc.), procedures, wiring and control diagrams, records of factory and field tests and device/controller settings and calibration, program lists or data compact discs, maintenance and warranty terms and contact information, spare parts listings, inspection procedures, emergency instructions, and other Operating and Maintenance documentation that may be useful to the Owner. The material and equipment data required by this Section must include all data necessary for the proper installation, removal, normal operation, emergency operation, startup, shutdown, maintenance, cleaning, adjustment, calibration, lubrication, assembly, disassembly, repair, inspection, trouble-shooting, and warranty service of the equipment or materials.

The Contractor must bind the Operating and Maintenance Manual documents in heavy-duty, 3-ring vinyl-covered binders including pocket folders for folded sheet information. Mark binder identification on both the front and spine of each binder. Binder information must list the project title, identify separate structures or locations as applicable, identify the general subject matter covered in the manual and must include the words "OPERATING AND MAINTENANCE INSTRUCTIONS".

The Contractor must submit the Operating and Maintenance documents on three-hole punched, 8-1/2-inch x 11-inch sheets or on three-hole punched sheets that are foldable in multiples of 8-1/2-inch x 11-inch. The three-hole punched edge will be the left 11-inch edge.

1. Materials are provided for Owner's use, reproduction and distribution as training and reference materials within Owner's organization.
2. Applicable to hard copy or electronic media.
3. Applicable to materials containing copyright notice as well as those with no copyright notice.
4. Notify manufacturer of this intended use of materials provided under the Contract.
5. Number each Operation and Maintenance Manual transmittal with the original root number of the associated Shop Drawing.
6. Identify resubmittals with the original number plus a suffix letter starting with "A."
7. Submittal format:
 - a. Interim submittals: Submit two (2) paper copies until manual is approved.
 - b. Final submittals:
 - (1) Within 30-days of receipt of approval, submit one (1) additional paper copy and two (2) electronic copies on USB in searchable Portable Document Format (PDF).
8. Compact discs to be secured in jewel cases.
9. Electronic copies will be reviewed for conformance with the approved paper copy and the electronic copy (PDF) requirements of this Specification.
10. Non-conforming USBs will be returned with comments.
11. Provide final USBs within 30-days of receipt of comments.
12. Paper copy submittals:
 - a. Submit Operation and Maintenance Manuals printed on 8-1/2-inch x 11-inch size heavy first quality paper with standard three-hole punching and bound in appropriately sized three-ring (or post) vinyl view binders with clear overlays front, spine and back.
 - b. Provide binders with titles inserted under clear overlay on front and on spine of each binder.
 - c. As space allows, binder titles shall include, but not necessarily be limited to:
 - (1) Project Name
 - (2) Related Specification Number
 - (3) Equipment Name(s) and
 - (4) Project Equipment Tag Numbers
 - d. Provide a Cover Page for each manual with the following information:
 - (1) Manufacturer(s)
 - (2) Date
 - (3) Project Owner and Project Name
 - (4) Specification Section
 - (5) Project Equipment Tag Numbers

- (6) Model Numbers
 - (7) Engineer
 - (8) Contractor
 - e. Provide a Table of Contents or Index for each manual.
 - f. Use plastic-coated dividers to tab each section of each manual per the manual's Table of Contents/Index for easy reference.
 - g. Provide plastic sheet lifters prior to first page and following last page.
 - h. Reduce Drawings or diagrams bound in manuals to an 8-1/2-inch x 11-inch or 11-inch x 17-inch size.
 - i. Where reduction is not practical to ensure readability, fold larger Drawings separately and place in vinyl envelopes which are bound into the binder.
 - j. Identify vinyl envelopes with Drawing numbers.
 - k. Mark each sheet to clearly identify specific products and component parts and data applicable to the installation for the Project.
 - l. Delete or cross out information that does not specifically apply to the Project.
- B. Electronic copy submittals:
1. Electronic copies of the approved paper copy Operation and Maintenance Manuals are to be produced in Adobe Acrobat's Portable Document Format (PDF) Version {5.0} or higher.
 2. Do *not* password protect and/or lock the PDF document.
 3. Drawings or other graphics must be converted to PDF format and made part of the PDF document.
 4. Scanning to be used only where actual file conversion is not possible.
 5. Rotate pages that must be viewed in landscape to the appropriate position for easy reading.
 6. Images only shall be scanned at a resolution of 300 dpi or greater.
 7. Perform Optical Character Recognition (OCR) capture on all images.
 8. Achieve OCR with the "original image with hidden text" option.
 9. Word searches of the PDF document must operate successfully to demonstrate OCR compliance.
 10. Create bookmarks in the navigation frame, for each entry in the Table of Contents/Index.
 11. Normally three levels deep (i.e., "Chapter," "Section," "Sub-section").
 12. Thumbnails must be generated for each PDF file.
 13. Set the opening view for PDF files as follows:
 - a. Initial view: Bookmarks and Page.
 - b. Magnification: Fit in Window.
 - c. Page layout: Single page.
 - d. Set the file to open to the cover page of the manual with bookmarks to the left, and the first bookmark linked to the cover page.
 - e. All PDF documents shall be set with the option "Fast Web View" to open the first pages of the document for the viewer while the rest of the document continues to load.
 14. File naming conventions
 - a. File names shall use a "ten dot three" convention (XXXXX-YY-Z.PDF) where XXXXX is the Specification Section number, YY is the Shop Drawing Root number and Z is an ID number used to designate the associated volume.

Example 1:

Two (2) pumps submitted as separate Shop Drawings under the same Specification Section:

Pump 1 = 11061-01-1.pdf.

Pump 2 = 11061-02-1.pdf.

Example 2:

Control system submitted as one (1) Shop Drawing but separated into two (2) O&M volumes:

Volume 1 = 13440-01-1.pdf.

Volume 2 = 13440-01-2.pdf.

15. As a minimum, include the following labeling on all USBs:

- a. Project Name
- b. Equipment Name and Project Tag Number
- c. Project Specification Section
- d. Manufacturer Name
- e. Vendor Name

1.04 Equipment and Systems

- A. Operation and Maintenance documentation is required for each piece of mechanical, electrical, communications, instrumentation and controls, pneumatic, hydraulic, conveyance, and special construction. If required by the technical specifications, provide Operation and Maintenance documentation for any other product not listed in the foregoing.
- B. Submission of Operation and Maintenance Manuals for equipment and systems is applicable but not necessarily limited to:
 1. Major equipment
 2. Equipment powered by electrical, pneumatic or hydraulic systems
 3. Specialized equipment and systems including instrumentation and control systems and system components for HVAC process system control
 4. Valves and water control gates
 5. Equipment function, normal operating characteristics, limiting operations
 6. Assembly, disassembly, installation, alignment, adjustment, and checking instructions
 7. Operating instructions for start-up, normal operation, control, shutdown, and emergency conditions
 8. Lubrication and maintenance instructions
 9. Troubleshooting guide
 10. Parts lists
 - a. Comprehensive parts and parts price lists.
 - b. List of spare parts provided as specified in the associated Specification Section.
 11. Outline, cross-section, and assembly Drawings; engineering data; and electrical diagrams, including elementary diagrams, wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.
 12. Test data and performance curves.
 13. As-constructed fabrication or layout Drawings and wiring diagrams.

14. Instrumentation or tag numbers assigned to the equipment by the Contract Documents are to be used to identify equipment and system components.
15. Additional information as specified in the associated equipment or system Specification Section.

1.05 Owner/Engineer's Review Action

- A. Owner/Engineer will review and indicate one of the following review actions:
 1. ACCEPTABLE
 2. REVISE AND RESUBMIT
- B. Acceptable paper copy submittals will be retained with the transmittal form returned with a request for one (1) additional paper copy and two (2) electronic copies on USB.
- C. Deficient submittals (paper copy and/or electronic copy) will be returned along with the transmittal form which will be marked to indicate deficient areas.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 Scope of Work

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1.02 Related Work

- A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.
- B. General closeout requirements are included in Section 01770 "Contract Closeout."
- C. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Division 2 through 16.

1.03 Definitions

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.04 Submittals

- A. Submit written warranties to the Owner prior to requesting a Substantial Completion Inspection as outlined in Section 01770 "Contract Closeout." If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner.
- B. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner within 15-days of completion of that designated portion of the Work.

- C. When a special warranty is required to be executed by the Contractor, or the Contractor and a Subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner for approval prior to final execution.
- D. Refer to individual Sections of Divisions 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.
- E. Prior to Substantial Completion Inspection, submit to the Owner two (2) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, Subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2-inch by 11-inch three-hole punched paper.
 - 2. Table of Contents will be neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified and the name of the product or work item.
 - 3. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer, supplier and manufacturer.
 - 4. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name and the name, address and telephone number of the Contractor.
 - 5. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.05 Warranty Requirement

- A. The Contractor will warrant all equipment in the Contractor's one-year warranty period even though certificates of warranty may not be required. For all major pieces of equipment, the Contractor shall submit a warranty from the equipment manufacturer. "Major" equipment is defined as a device having a 5 HP or larger motor or which lists for more than \$1,000.00.
- B. In the event that an equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at Substantial Completion, the Contractor will obtain from the manufacturer a warranty of sufficient length commencing at the time of equipment delivery to the job site, such that the warranty will extend to at least 1-year past substantial completion.
- C. If an individual specification section requires a particular warranty more stringent than that required by this Section or the General Conditions, the more stringent requirements will govern for the applicable portion of the Work.
- D. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

- E. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty will be equal to the original warranty with an equitable adjustment for depreciation.
- F. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- G. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and will not limit the duties, obligations, rights and remedies otherwise available under the law, nor will warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- H. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- I. The Owner reserves the right to refuse to accept Work for the project where a special warranty, certification, or similar commitment is required on such work or part of the Work, until evidence is presented that entities required to counter-sign such commitments are willing to do so.
- J. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 Deliverables

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and Subcontractors, and bind into a commercial quality standard 3-ring binder; submit 5 copies of the warranties and bonds to the Owner for review.
 - 1. The warranties and bonds shall include:
 - a. Equipment or product description
 - b. Manufacturer's name, principal, address and telephone number
 - c. Contractor, name of responsible principal, address and telephone number
 - d. Local supplier's or representatives name and address
 - e. Scope of warranty or bond
 - f. Proper procedure in case of failure
 - g. Instances which might affect the validity of warranty or bond
 - h. Date of beginning of warranty, bond or service and maintenance contract

- i. Duration of warranty, bond or service maintenance contract
- B. Warranties
 - 1. Furnish warranty for all pumps, electrical controls, and other mechanical equipment as specified elsewhere in these specifications and in addition to the Contractors required one-year warranty upon substantial completion issuance.

END OF SECTION

SECTION 01770

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 Section Includes

Substantial completion requirements, clean-up, final completion requirements, closeout submittals

1.02 Clean-Up Operations

- A. The entire Project site shall be thoroughly cleaned at the completion of the Work.
- B. Clean all installed pipelines, structures, sidewalks, paved areas, accumulated silt in ponds, plus all adjacent areas affected by construction, as directed by the Owner or jurisdictional agency. Equipment to clean these surfaces shall be subject to approval by the Owner.
- C. Restore to original condition or better all property not designated for alteration by the Contract Documents, including all areas used for staging and storage. Restoration includes but is not limited to fill replacement, regrading, compaction, and sodding. Conduct inspections of the completed restoration with the Owner, and conduct additional restoration as directed.

1.03 Substantial Completion Requirements

- A. Complete the following before requesting the inspection for certification of substantial completion.
 - 1. Submit record drawings in accordance with section 01780.
 - 2. Complete required cleaning and testing of the completed construction in accordance with the specifications and the Owner's operating and maintenance personnel.
- B. Work is not substantially complete until the following has occurred:
 - 1. The Owner has received clearance to place the completed construction into service from the regulatory agencies, all systems have been tested and signed off by the City.

1.04 Final Completion Requirements

- A. Complete the following before requesting the inspection for certification of final completion.
 - 1. All punchlist items identified during the substantial completion inspection.
 - 2. Deliver tools, spare parts, extra stocks of material and similar physical items to the Owner.

3. Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools and facilities, mock-ups, and similar elements.
4. Clean all marred surfaces including touch up painting, pressure washing, or other measures as needed as directed by the Owner.
5. Broom clean paved driveways and parking areas.
6. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
7. Fully restore all property not designated for construction including all areas used for staging and storage.
8. Provide Final Record Drawings in accordance with Section 01300.

1.05 Closeout Submittals

A. Upon completion of the project, or portions thereof, the Contractor shall transfer to the Owner all applicable items accumulated throughout construction. These include but are not limited to the following items:

1. Service manuals, installation instructions, maintenance and operating instructions, special tools, and specialties
2. Spare parts ordered as part of this Contract
3. Delivery of any salvaged or borrowed materials or equipment to the Owner
4. All keys to all doors, gates, and equipment
5. Checklist indicating satisfactory completion of all unfinished items from the final inspection
6. Certificate of Substantial Completion
7. Certificate of Final Completion
8. Submittal of the Material and Workmanship Bond
9. Submittal of manufacturers' guarantees, warranties, bonds, and letters of coverage extending beyond the time limitations of the Contractor's guarantee.
10. Contractor's Final Release of Lien
11. Final Waivers of lien from all Subcontractors and Suppliers
12. Consent of Surety to Final Payment
13. Final record documents of completed facilities
14. Certificate of Final Inspection – N/A

B. Closeout Submittals provided by others include:

1. Certificate of Engineer/Architect – N/A

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
RECORD DRAWINGS

PART 1 - GENERAL

1.01 Section Includes

Record Drawing requirements including format requirements and submittal procedures.

1.02 General Requirements

- A. As the Work progresses, the Contractor shall be responsible for recording information on the approved Contract Documents concurrently with construction progress.
- B. Mark on the Contract Drawings all changes in direction and location of structure, piping, equipment, electrical, and mechanical work.
- C. If requested, mark on the Specifications the manufacturer, trade name, catalog, and supplier of each product actually installed, and mark changes made by Change Order or Field Order.
- D. Record Drawings shall depict surveyed as-built information including horizontal and vertical locations as required herein. All Record Drawings shall be prepared by the Contractor in ACAD format using construction plan sheets provided by the Engineer. As-built information shall be field verified, measured, added to the ACAD files of the construction plan sheets provided by the Engineer, and certified, signed and sealed by the Contractor's licensed Surveyor who will be responsible for the accuracy of all dimensions and elevations. Sheet sizes and the scale of the Record Drawings shall match sheet sizing and scale of the construction plans. Add blowup details if necessary.
- E. Record Drawings shall clearly show all field changes of dimension and detail including changes made by field order or by change order.
- F. The surveyed as-built information shall be vertically based on the North American Vertical Datum of 1988 (NAVD 88) and the coordinate system shall be based horizontally on the North American Datum 83 (NAD83) (1990 adjustment). The as-built survey shall be referenced to the project benchmarks and shall be referenced to the state plane coordinates. All valves (center of pipe) and valve boxes (grade), hydrants (grade), blow offs (grade), sample points (grade) and meter boxes (grade), etc. shall be clearly shown.

- G. The surveyed as-built location of the newly constructed facilities shall be in an ACAD overall base drawing which is in State Plane. Providing “paper space” views that are not in State Plane of the constructed facilities is not acceptable. Providing northing and easting point tables on separate new sheets added to the construction plans is not acceptable. The as-built northing and easting data must be on the individual construction plan sheets to which the data applies.
- H. All water valves, hydrants, and blowoffs shall be horizontally referenced from at least two and preferably three permanent points.
- I. The as-built information shown on the Record Drawings is to include, but not be limited to, the following:
1. Horizontal locations (state plane coordinates and stations and offsets) and vertical elevations for all utility and storm structures including but not limited to manholes, inlets and cleanouts, including structure top and invert elevations and invert elevations of all connecting pipes.
 2. Distance along pipelines between structures.
 3. Stormwater pond top of berm and pond bottom elevations and horizontal dimensions measured at a minimum of ten locations per pond, at locations designated by the engineer. Top of pond horizontal dimensions are also to be tied to property corners, easements, and rights-of-way.
 4. Stormwater control structure dimensions and elevations, including all weirs, slots, orifices, grates, and skimmers.
 5. Stormwater conveyance systems including dimensions, elevations, contours, and cross sections.
 6. Horizontal locations (state plane coordinates and stations and offsets) and vertical elevations of all utility valves, fittings, connection points, etc.
 7. Vertical elevations of all pipelines at crossings of potable water mains (whether the water main is existing or new) in order to document that the minimum required vertical separation has been met.
 8. Grade elevation above utility pipeline where vertical elevations are required at all utility valves, fittings, connection points, etc.
 9. Horizontal offsets from adjacent potable water mains (whether the water main is existing or new) in order to document that the minimum required horizontal separation has been met.
 10. Utility pipeline horizontal locations (state plane coordinates and stations and offsets) and tied horizontally to edge of pavement and right-of-way lines, located every 200-ft plus all changes in horizontal offset.
 11. Vertical elevations of the top of casing and top of carrier pipe measured at each end of crossings that have been jack and bored.
 12. Horizontal locations (state plane coordinates and stations and offsets) of each end of steel casing pipe (also provide distance from edge of pavement and adjacent right-of-way lines).
 13. Pipeline that is directional bored is to be horizontally and vertically located every 20’ along the bore. Provide this information by submitting boring logs and by drawing the as-built vertical and horizontal locations of the bored pipeline on the record drawings based on the boring logs. Provide state plane coordinates at each end of directional bored pipeline.

14. Pavement width and elevations at the centerline and edge of pavement every 200 feet plus at all changes in longitudinal slope, cross slope, inlet locations, and at all driveway and street intersections. For parking lots, record centerline and edge of pavement elevations along all drive aisles and islands.
15. All parking areas and sidewalk ramps designated for handicap access shall contain horizontal and vertical measurements in order to verify required widths and slopes have been met.
16. The horizontal location (state plane coordinates and stations and offsets) of all new pull and splice boxes.
17. The new lift station wet well top and inside bottom elevations, plus inverts of all connecting pipelines.
18. Lift station surveyed layout (horizontal and vertical) of all structures, valves, panels, conduits, piping, corners of all concrete pads and slabs, and bollards.
19. Valve vault top elevation, inside bottom elevation, and top of pipe elevations.
20. The horizontal location (state plane coordinates) at the lift station wet well and valve vault.
21. Horizontal and vertical data for any construction that deviates from the construction drawings.
22. Where the plans contain specific horizontal location data, such as station and offset, the as-built drawings are to reflect the actual horizontal location.
23. Where the plans contain specific vertical elevation data, the as-built drawings are to reflect the actual measured vertical elevation.

1.03 Submittal Requirements

- A. Record Drawings are to be prepared by the Contractor, certified by the Contractor's licensed surveyor, and delivered to the Engineer for review. The Engineer will review the drawings for completeness in accordance with the requirements of this section within seven (7) full working days. For preliminary review, submittal in ACAD and PDF format is sufficient and signed and sealed copies are not necessary. Final submittal of complete Record Drawings shall consist of one set signed and sealed by the Contractor's licensed surveyor plus ACAD and PDF files of the Record Drawings delivered to the Engineer.
- B. If the drawings are found to be incomplete or inaccurate, the drawings will be returned to the Contractor for correction.
- C. In cases where the Owner determines partial clearances from permitting agencies are beneficial to the Owner for completed portions of the project, provide preliminary record drawings (ACAD format) to the Engineer for its use in preparing the partial clearance applications for the Owner.
- D. Complete record drawings that are found to be satisfactory as a result of the Engineer's review will be used as the basis for the final project Record Drawings prepared by the Engineer using the Contractor provided record drawings plus Engineer added information.

- E. Complete signed and sealed Record Drawings are required to be delivered to the Owner prior to final inspection of the project. Final inspections will only be scheduled upon receipt of signed and sealed record drawings that have been reviewed by the Engineer and delivered by the Engineer to the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 02220
SITE DEMOLITION

PART 1 GENERAL

1.01 Section Includes General Details Relative to: – See Sheet C-3 for items to be demolished

- A. Demolition of designated site structures, retaining walls and foundations and removal of materials from project site.
- B. Demolition and removal of pavements, curbs and gutters, drainage structures, utilities, signage or landscaping.
- C. Disconnecting and capping or removal of identified utilities.
- D. Filling voids in subgrade created as a result of removals or demolition.
- E. Disposal of demolished materials.

1.02 Related Sections

- A. Section 02230 - Site Preparation
- B. Section 02310 - Finish Grading

1.03 Regulatory Requirements

- A. Conform to applicable State and local codes for demolition of structures, safety of adjacent structures, dust control, and runoff control.
- B. Obtain required permits and licenses from appropriate authorities. Pay associated fees including disposal charges.
- C. Notify affected utility companies before starting work and comply with their requirements.
- D. Do not close or obstruct roadways, sidewalks, or fire hydrants without appropriate permits.
- E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.
- F. Test soils around buried tanks for contamination.

1.04 Project Record Documents

Accurately record actual locations of capped utilities and subsurface obstructions that will remain after demolition.

1.05 Project Conditions

- A. Structures to be demolished will be discontinued in use and vacated prior to start of work.
- B. Owner assumes no responsibility for condition of structures to be demolished.
- C. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner as practicable. Variations within structures may occur by the Owner's removal and salvage operations prior to start of demolition work.
- D. Unless otherwise indicated in Contract Documents or specified by the Owner, items of salvageable value to Contractor shall be removed from site and structures. Storage or sale of removed items on site will not be permitted and shall not interfere with other work specified in Contract Documents.
- E. Explosives shall not be brought to site or used to demolish structures.

1.06 Sequencing

- A. Interruption of facility operations must be kept to a minimum and no interruption of service to the Owner's customers can be allowed.

1.07 Scheduling

- A. Notify the Owner, utility companies or local authorities furnishing gas, water, electrical, telephone or wastewater service, a minimum of fourteen (14) calendar days prior to starting the work, to remove any equipment owned by them in structures to be demolished and to remove, disconnect, cap or plug their services to facilitate demolition.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.01 Preparation

- A. Provide, erect, and maintain erosion control devices, temporary barriers, and security devices at locations indicated on Construction Drawings.
- B. Protect existing landscaping materials, appurtenances, and structures which are not to be demolished. Repair damage caused by demolition operations at no cost to the Owner.

- C. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as needed.
- D. Mark location of utilities. Protect and maintain in safe and operable condition utilities that are to remain. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to the Owner.

3.02 Salvage – N/A

3.03 Demolition Requirements

- A. Conduct demolition to minimize interference with adjacent structures or pavements.
- B. Cease operations immediately if adjacent structures appear to be in danger and notify the Owner. Do not resume operations until directed by the Owner.
- C. Conduct operations with minimum of interference to public or private access. Maintain ingress and egress at all times.
- D. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon, or limit access to their property.
- E. Sprinkle work with water to minimize dust. Provide hoses and water connections for this purpose.
- F. Comply with governing regulations pertaining to environmental protection.
- G. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.
- H. Demolition plan identifies major structures and items to be demolished. Include incidental demolition to completely demolish structures whether indicated on plan or not.

3.04 Demolition

- A. Demolish buildings completely and remove from site using methods as required to complete work within limitations of governing regulations. Small structures may be removed intact when acceptable to the Owner.
- B. Locate demolition equipment and remove materials so as to prevent excessive loading to supporting walls, floors, or framing.
- C. Demolish concrete and masonry in small sections. Break up concrete slabs-on-grade that are 2-feet or more below proposed subgrade. Remove slabs-on-grade and below grade construction within 2-feet of proposed subgrade.

3.05 Filling Voids

- A. Completely fill below grade areas and voids resulting from demolition or removal of structures, underground fuel storage tanks, wells, cisterns, etc., using approved select fill materials consisting of stone, gravel, and sand free from debris, trash, frozen materials, roots, and other organic matter.
- B. Ensure that areas to be filled are free of standing water, frost, or unsuitable material, trash, and debris prior to fill placement.
- C. Place fill materials in accordance with Section 02250 as applicable unless subsequent excavation for new work is required.
- D. Grade surface to match adjacent grades and to provide flow of surface drainage after fill placement and compaction.

3.06 Disposal of Demolished Materials

- A. Remove from site debris, rubbish, and other materials resulting from demolition operations.
- B. No burning of any material, debris, or trash on-site or off-site will be allowed.
- C. Transport materials removed from demolished structures with appropriate vehicles and dispose off-site to areas that are approved for disposal by governing authorities and appropriate property owners.

3.07 Cleanup

- A. Clean the Project site to a condition satisfactory to the Engineer, free from demolished materials, rubbish or debris. Grade the site to meet adjacent contours and provide a positive flow for surface drainage.
- B. Restore items intended to remain that have been damaged by demolition work at no cost to, and to the satisfaction of the Owner.
- C. Return all interrupted utility services to their pre-demolition state and disconnect temporary services, unless otherwise specified.

END OF SECTION

SECTION 02230
SITE PREPARATION

PART 1 - GENERAL

1.01 Section Includes

- A. Layout of work and protection of bench marks.
- B. Protection of structures, trees, or vegetation to remain.
- C. Clearing and grubbing.
- D. Stripping and storing topsoil.

1.02 Related Sections

- A. Section 02220 - Site Demolition
- B. Section 02370 - Erosion and Sedimentation Control

1.03 Coordination

- A. Notify the following utility owners which may have utilities in the project area and coordinate with them to avoid service interruptions and/or safety hazards:
 - 1. Duke Energy
 - 2. City of Ocoee
- B. Contact "Sunshine State, One-Call" by dialing "811", to determine if there are other utilities in the area, and their location. For additional information: www.callsunshine.com.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 Bench Marks and Monuments

Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of the Owner. All benchmarks, property corners, and other survey monuments that are lost, damaged, or destroyed shall be replaced by a Licensed Surveyor at the Contractor's expense.

3.02 Laying Out Work

- A. Base lines, property lines, and easement lines, are shown on the Drawings. Benchmarks utilized are also shown on the drawings.
- B. Stake out the construction, establish lines and levels, temporary bench marks, batter boards, centerlines and reference points for the work, and verify all dimensions relating to interconnection with existing features.
- C. Report any inconsistencies in the proposed grades, lines and levels, dimensions and locations to the Engineer before commencing work.
- D. Contain all construction activities within the right-of-way, easements, and property secured by the Owner, as shown on the drawings. Do not disturb surrounding properties or travel on surrounding properties without written consent from the property owner. Repair or reconstruct damaged areas on an immediate basis. All costs for repairs shall be the responsibility of the Contractor.

3.03 Burning

Burning is not allowed, unless notes on the drawings specifically allow it to occur. In the event burning is allowed, secure all necessary permits.

3.04 Protection of Trees and Shrubs

- A. Protect all trees and shrubs located outside the right-of-way, easements, and Owner secured property, particularly those trees and shrubs located adjacent to work areas.
- B. Within the right-of-way, easements, and Owner secured property, the intent is to allow trees and shrubs to remain in accordance with the following schedule:
 - 1. New roadway construction – trees and shrubs to remain where located more than 15 feet from the back of curb, or outside the limits of excavation or fill areas, whichever is further.
 - 2. Utility pipeline construction – trees and shrubs to remain outside a 15-foot-wide path, centered on the pipeline.
- C. Protect branches, trunks, and roots of trees and shrubs that are to remain. Trees to remain in the construction area shall be boxed, fenced or otherwise protected before any work is started; remove boxing when directed by the Engineer. Do not permit heavy equipment or stockpiles within branch spread. Remove interfering branches without injury to trunks and cover scars with tree paint.

3.05 Relocation of Utilities

- A. Active utilities which do not interfere with the work shall be supported and protected from damage. After obtaining the Engineer's approval, relocate or remove active utilities which will interfere with work as indicated. Pay for all damage to active utilities and for relocation or removal of all interfering utilities which are ascertainable from Drawings, surveys, site inspection or encountered during construction.
- B. Coordinate with each utility and pay all costs associated with the protection of existing facilities during construction. Also coordinate necessary relocations or other construction related matters with each utility.
- C. Inactive or abandoned utilities and appurtenant structures encountered shall be removed to avoid interference as directed by the Engineer. Exposed ends of abandoned lines shall be plugged or capped in a water-tight manner.

3.06 Clearing and Grubbing

- A. Areas to receive clearing and grubbing shall include all areas to be occupied by the proposed improvements, areas for fill and site grading, and borrow sites. Remove trees outside of these areas only as indicated on the Drawings or as approved in writing by the Engineer.
- B. Clearing shall consist of removing trees and brush and disposal of other materials that encroach upon or otherwise obstruct the work.
- C. Exercise extreme care during the clearing and grubbing operations. Do not damage existing structures, pipes or utilities.
- D. Grubbing shall consist of removing and disposing of stumps, roots larger than 2" in diameter, and matted roots. Remove to a depth of not less than 18" below the original surface level of the ground.
- E. All combustible debris and refuse from site preparation operations shall be removed to legal offsite disposal areas.

3.07 Topsoil Removal

- A. All areas to be occupied by proposed improvements, and borrow sites shall be stripped of all brush, weeds, grass, roots and other material.
- B. Remove all loamy, organic topsoil suitable for seeding and planting to whatever depth encountered and store separately from other excavated material. Stockpile in designated areas and provide for proper drainage. Cover storage piles as required to prevent windblown dust.
- C. All removed topsoil shall be stockpiled within the project work area. Topsoil can be incorporated into the project in all areas that are to be grassed.

- D. Dispose of unsuitable topsoil as specified under disposal of debris. Excess topsoil shall be removed from site unless specifically noted on Contract Drawings.

3.08 Disposal of Debris

- A. All combustible debris and refuse from site preparation operations shall be removed to legal offsite disposal areas.
- B. All non-combustible debris (not including acceptable fill material, fences, or other structures), resulting from site preparation operations shall become the property of the Contractor and shall be removed to legal offsite disposal areas.

END OF SECTION

SECTION 02240

DEWATERING

PART 1 - GENERAL

1.01 Section Includes

Dewatering design and operation requirements

1.02 Related Sections

Section 02370 - Erosion and Sediment Control

1.03 General Requirements

- A. Obtain the services of a qualified dewatering specialist to provide dewatering plan as may be necessary to complete the Work. Contractor shall be solely responsible for the design, installation, operation, maintenance, and any failure of any component of the system.
- B. Dewatering discharge from the site shall comply with all NPDES general permit requirements and state water quality standards. Provide all testing and permitting required and comply with all treatment or disposal methods required to meet all local, state and federal requirements.
- C. Design and provide dewatering system using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom and/or sides. Design system to prevent differential hydrostatic head which would result in floating out soil particles in a manner termed as a "quick" or "boiling" condition. System shall not be dependent solely upon sumps and/or pumping water from within the excavation where differential head would result in a quick condition, which would continue to worsen the integrity of the excavation's stability.
- D. Provide dewatering system of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow all Work to be installed in a dry condition.
- E. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.
- F. If dewatering equipment needed exceeds any of the following: 1) 6" pump volute; 2) 100,000 GPD total 24-hour (1 day) dewatering, and; 3) 1,000,000 GPD pump capacity, the Contractor shall be required to permit the dewatering system with the water management district.

- G. Contractor shall be responsible for and shall repair without cost to the Owner any damage to work in place, or other contractor's equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, natural resources, habitat, existing wells, and the excavation, including, damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor's negligence, inadequate or improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 General Requirements

- A. Control, by acceptable means, all water regardless of source and be fully responsible for disposal of the water.
- B. Confine discharge piping and/or ditches to available easement or to additional easement obtained by Contractor.
- C. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures. Where necessary to these purposes, lower water level in advance of excavation, utilizing wells, wellpoints, jet educators, or similar positive methods. Maintain the groundwater level to a minimum of 2 feet below excavations. Provide piezometers if directed by the Engineer to document the groundwater level is being maintained.
- D. Commence dewatering prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.
- E. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.
- F. Install wells and/or wellpoints, if required, with suitable screens and filters, so that continuous pumping of fines does not occur. During normal pumping, and upon development of well(s), levels of fine sand or silt in the discharge water shall not exceed 5 ppm. Install sand tester on discharge of each pump during testing to verify that levels are not exceeded.
- G. Control grading around excavations to prevent surface water from flowing into excavation areas.
- H. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to the Owner.
- I. Walls shall not be exposed to water pressure before structural work at the next higher level has properly cured and the cantilever action of walls is eliminated.

- J. Any dewatering pumps within 1500-ft of private residences shall be equipped with satisfactory sound suppression.
- K. Water from dewatering activities shall be disposed in a manner that does not cause flooding, erosion, or the transfer of sediments.

3.02 Maintaining Excavation in Dewatering Condition

- A. Dewatering shall be a continuous operation. Interruptions due to power outages, or any other reason will not be permitted.
- B. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.
- C. Provide standby equipment on site, installed, wired, and available for immediate operation if required to maintain dewatering on a continuous basis in the event any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.
- D. System maintenance shall include but not be limited to 24-hour supervision by personnel skilled in the operation, maintenance, and replacement of system components, and any other work required to maintain excavation in dewatered condition.

3.03 System Removal

Remove all dewatering equipment from the site, including wells and related temporary electrical service.

END OF SECTION

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SECTION 02250

COMPACTION CONTROL AND TESTING

PART 1 - GENERAL

1.01 Description

- A. Work Specified Herein and Elsewhere
 - 1. Work under this Section includes:
 - a. Placement, compaction control, and field density testing requirements for all earthwork, including pavement subgrade.
 - 2. Related work specified elsewhere:
 - a. Trenching, Bedding, Cover, and Backfilling - Section 02320.
 - b. Excavation and Fill - Section 02315.
 - c. Finish Grading - Section 02310.

1.02 Testing

- A. Tests will be performed by an approved independent soils laboratory to insure adequate density is being obtained. The Engineer shall approve selected soils laboratory and designate where and when samples shall be taken. The Contractor will pay initial costs to make tests. The laboratory shall submit test reports to the Engineer and the Contractor.

PART 2 - PRODUCTS

2.01 Materials

- A. All materials and products are specified elsewhere in Division 2.

PART 3 - EXECUTION

3.01 Fill Placement

- A. Compacted material that has been flooded and no longer meets the density specified shall be removed, replaced and recompacted.
- B. If the in-place surface has dried, sprinkle with water before placing the next lift. The surface of smooth lifts shall be scarified before the next lift is placed.
- C. Where fill is required on both sides of structures, fill and compact simultaneously on opposite sides in even layers. Other filling sequences shall be as specifically indicated on the Drawings.

- D. Fill shall be spread in uniform horizontal lifts. The material shall be thoroughly mixed to insure a uniform moisture content slightly wetter than optimum but not greater than 5 percent above optimum water content as determined by the Modified Proctor Test, ASTM D1557.
- E. Where cohesive structural fill is used, the moisture content when compacted shall be within 3 percent of the optimum moisture content. If the fill does not have a natural water content which falls within the acceptable range, the Contractor shall mix, dry, or moisten as necessary.
- F. Place and compact each lift over an entire area prior to placing successive lifts, unless otherwise approved by the Engineer.
- G. All materials shall be placed in loose lift thicknesses indicated hereafter.

3.02 Compaction

- A. General
 - 1. Unless otherwise indicated, the type of equipment and number of passes required to obtain the specified degree of compaction shall be determined at the site, subject to the approval of the Engineer.
 - 2. Provide mechanical compaction for cohesive material and vibratory compaction for granular materials, unless otherwise approved by the Engineer.
- B. Noncohesive soils shall be compacted with vibrating roller or equivalent; cohesive soils shall be compacted with sheeps-foot roller, pneumatic tamping, or approved equivalent, unless otherwise indicated.
- C. Water Jetting
 - 1. Water jetting, as specified in Section 02221, shall have the fill thoroughly and uniformly watered, avoiding excessive wetting of the adjacent material and surface runoff. Jet within 30 days of fill placement. Methods and procedures shall be subject to approval of the Engineer.
- D. Granular Drainage Blankets
 - 1. Granular drainage blankets, as specified in Sections 02223 and 02590, shall have each lift thoroughly and uniformly watered, avoiding excessive wetting of the less pervious material underneath. Compaction methods and procedures shall be subject to approval of the Engineer.
- E. Topsoil
 - 1. Topsoil, as specified in Section 02310, shall be compacted with a "cultipacker", roller, or approved equivalent equipment weighing 100 to 160 pounds per lineal foot of roller width.

3.03 Fill Lift Thicknesses and Compaction Densities

- A. Unless otherwise indicated or approved by the Engineer, place fills in the loose lift thicknesses indicated hereafter, except when water jetting, and compact to a dry density not less than the following percentage of maximum dry density, determined by the Modified Proctor Test, ASTM D1557, unless otherwise noted.

3.04 Testing

- A. The Contractor shall assist in providing samples for the following field density tests to insure required densities are being obtained:
1. One test for each 10,000 square feet or fraction thereof per lift of general backfilling.
 2. Two tests for each 10,000 square feet or fraction thereof per lift of structural fill under slabs, foundations, and pavements.
 3. One test per lift for each other type of fill, if so directed by the Engineer.
- B. Tests shall be in accordance with ASTM D1557 or other tests suitable for the materials being tested.
- C. The Contractor will pay for initial field density tests. Subsequent tests and associated costs necessitated as a result of the initial tests failing to meet specified requirements will be at the expense of the Contractor.

TYPE OF FILL PROCTOR TEST	USAGE	REQ'D % OF LIFT MODIFIED THICKNESS	
Trenched Pipe Bedding	Beneath piping	6"	95 D1557
Trenched Pipe Cover	Over and/or around piping	6"	95 D1557
Utilities Trench Backfill	"Influence area" beneath other piping or utility lines	8"	95 D1557
	"Influence area" beneath rigid paving and railroad tracks.	6"	95 D1557
	"Influent area" beneath non-rigid paving	9"	95 D1557
	Adjacent to or under structures	9"	98 D1557

	Croplands, plant site, lawns and landscaped areas	12"	85 D1557
Preloading	Soil stabilization	12"	85 D1557
Structural Fill	All locations under major structures and all lagoon structures.	6"	98 D1557
	All locations under minor structures (manholes, etc.)	6"	95 D1557
Impermeable	All locations	6" Fill	98 D1557
Granular Fill	Below concrete slab bedding, foundations, rigid paving, and excavated areas adjacent to structures	8"	98 D1557
	All other uses	12"	85 D1557
Granular Bedding	Beneath concrete slabs	6"	95 D1557
Granular Drainage Blanket	Below concrete slabs, paving, or piping	9"	95 D2049
	All other uses	12"	85 D2049
Granular Filter	Around open joint or perforated drain pipes and at pressure relief valves	9"	95 D1557
Structural Backfill	See Trench Backfill		
General Site Grading	Lagoon Embankment	8"	95 D1557
	Lagoon bentonite - soil mixtures	--	95 D1557
	Fill for abandoned or demolished structures	12"	85 D1557
	Fill in other locations not covered herein	12"	85 D1557
	Topsoil placement	12"	85 D1557

"Influence area" shall be considered the area within lines sloped downward at 45 degrees from the outer edges of paving, foundations, and utility lines.

END OF SECTION

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SECTION 02310

FINISH GRADING

PART 1 - GENERAL

1.01 Section Includes

Topsoil placement, grading of site

1.02 Related Sections

- A. Section 02230 - Site Preparation
- B. Section 02315 - Excavation and Fill
- C. Section 02320 - Trenching, Bedding, and Backfilling

1.03 References

- A. American Association of State Highway and Transportation Officials (AASHTO) latest edition:
 - 1. AASHTO T267 – Determination of Organic Matter in Soils by Loss on Ignition

PART 2 - PRODUCTS

2.01 Topsoil

- A. Topsoil shall be fertile, friable, natural topsoil typical of the area, free from subsoil, stones, plants, roots or other extraneous material and shall not be used while muddy or frozen.
- B. Topsoil shall contain not less than 8% organic matter (AASHTO T267). The topsoil shall consist of either natural topsoils typical of the locality and free from coarse stone aggregate or surface soils stripped from the site and enriched with humus at a rate of 8% by volume. The soil mixture prepared by mixing surface soils and humus shall be free of oil, cinders, coarse stone, and woody root material.

PART 3 - EXECUTION

3.01 General

Provide all topsoil placement and finish grading and filling to achieve the lines and grades indicated on the Drawings. All earthwork shall be done in a manner that provides drainage.

3.02 Topsoil Placement

Place topsoil in all areas of new grading. The compacted subgrade to receive topsoil shall be scarified to a depth of 3 inches. Topsoil shall be spread evenly and compacted to a thickness of not less than 6 inches, to the proposed elevations and grades. Grade flush with walks, curbs, and paving.

3.03 Finish Grading

- A. All areas of the project including all previously grassed areas that have been disturbed, borrow sites, excavated and filled sections and adjacent transition areas shall be uniformly smooth-graded. Depressions from settlement shall be filled and compacted. Tops of embankments and breaks in grade shall be rounded. All surfaces shall be finished to provide adequate drainage. Finished surfaces shall be reasonably smooth, compacted, free from irregular surface changes and comparable to the smoothness obtained by blade-grader operations.
- B. Slope grades to drain away from structures at a minimum of ¼-inch per foot for 10 feet.
- C. Finished surfaces adjacent to paved or surfaced areas and within 10 feet of structures shall be within 1 inch of the proposed grade. All other areas shall be within 3 inches of the proposed grade.
- D. Newly graded areas shall be protected from traffic and erosion. All settlement or washing away that may occur from any cause prior to seeding or acceptance shall be repaired and grades re-established to the required elevations and slopes at no additional cost to the Owner.
- E. Unless otherwise indicated, dispose of all surplus material.

END OF SECTION

SECTION 02315
EXCAVATION AND FILL

PART 1 - GENERAL

1.01 Section Includes

- A. Excavation and fill for roads, ponds, general site work
- B. Sheet piling, shoring and bracing
- C. Compaction

1.02 Related Sections

- A. Section 02230 - Site Preparation
- B. Section 02240 - Dewatering
- C. Section 02310 - Finish Grading
- D. Section 02320 - Trenching, Bedding, and Backfilling
- E. Section 02370 - Erosion and Sedimentation Control

1.03 References

- A. American Association of State Highway and Transportation Officials (AASHTO) latest edition:
 - 1. AASHTO M145 - Classification of Soils and Soil Aggregate Mixtures
 - 2. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb Rammer and 18-in Drop
- B. American Society for Testing and Materials (ASTM) latest edition:
 - 1. ASTM D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort
 - 2. ASTM D2487 - Classification of Soils for Engineering Purposes
- C. Occupational Safety and Health Administration (OSHA) Regulations, including:
 - 1. Part 1926 Subpart P – Excavations

1.04 Definitions

- A. Backfill = material placed in newly excavated areas to the topsoil, paving sub-grade, or foundation level.

- B. Influence Area = the area within lines sloped downward at 45 degrees from the outer edges of paving, foundations, and utility lines. As a minimum, the influence area shall extend 5 feet beyond the edge of pavement (where there is no curb) or 5 feet beyond the back of curb.

1.05 Quality Assurance

- A. Field density testing frequencies:
 - 1. One test for each 5,000 square feet or fraction thereof per lift of general backfilling, minimum 2 tests each layer.
 - 2. One test per each lift of backfill around and under structures.
 - 3. One test per lift per each change in type of fill.
 - 4. One test per 1000 square feet of pavement subgrade, minimum of 2 tests.
- B. Pond construction shall result in the finished pond having side slopes and dimensions that are in accordance with the construction drawings. It is the Contractor's sole responsibility to ensure that these requirements have been met. If the constructed side slopes are steeper than the required side slopes, or the pond volume is not within three (3) percent of the design volume, the Contractor may be required to make corrections to the pond at no additional cost to the Owner.
- C. Sheeting, shoring, and bracing used for the support of excavations over 20 feet deep shall be designed by a professional engineer licensed by the State of Florida.

1.06 Preconstruction Requirements

Precondition surveys and vibration monitoring are required for those areas where residential structures are within 100 feet of the proposed construction.

PART 2 - PRODUCTS

2.01 General

It is intended that previously excavated materials conforming to the following requirements be utilized wherever possible.

2.02 Materials

- A. Acceptable materials (suitable material): AASHTO M145 classification A-1, A-3, A-2-4, A-2-6; ASTM D2487 classification GW, GP, GM, SM, SW, SP; unless otherwise disapproved within the Soil and Subsurface investigation reports. No more than 12% of acceptable materials shall pass the number 200 sieve.

- B. Unacceptable materials (unsuitable material): AASHTO M145 classification A-2-5, A-2-7, A-4, A-5, A-6, A-7, A-8; ASTM D2487 classification GC, SC, ML, MH, CL, CH, OL, OH, PT; unless otherwise approved within the Soil and Subsurface investigation reports.
- C. Flowable fill shall be "Excavatable" and shall meet the requirements of FDOT specification section 121, with a maximum 28-day compressive strength of 100 psi and a minimum 28-day compressive strength of 80 psi.

2.03 Sheeting, Shoring, and Bracing

- A. The structural strength and safety of all sheeting, shoring and bracing shall be the sole responsibility of the Contractor. Repair any damage resulting from failure to provide adequate supports.
- B. Provide timber work, shoring, bracing, sheeting, and sheet piling where necessary to retain banks of excavations, prevent cave-in of adjacent ground, prevent displacement of utilities and structures, and to protect public safety.
- C. Contractor is solely responsible for the design, installation, and operation of dewatering systems and their safety and conformity with local codes and regulations.

PART 3 - EXECUTION

3.01 General Construction Requirements

- A. Provide suitable temporary drainage channels for any water that may flow along or across the work as specified hereafter.
- B. Provide barriers, warning lights and other protective devices at all excavations.
- C. Sidewalks, roads, streets, and pavements shall not be blocked or obstructed by excavated materials, except as authorized by the Engineer, in which case adequate temporary provisions must be made for satisfactory temporary passage of pedestrians, and vehicles. Minimize inconvenience to public travel or to tenants occupying adjoining property.
- D. Where necessary to place excavated material adjacent to buildings, erect barriers to keep earth at least 4 feet from such buildings. Earth deposited on lawns shall be promptly and carefully removed to preserve the turf. All trees, shrubs, and landscaping shall be protected. Boring and jacking shall be used, if necessary, except where written permission is granted to remove trees and shrubs.

- E. If open excavations cross existing rigid surfacing, the surfacing shall be removed for a width one foot beyond the anticipated edge of the excavation. The pavement break shall be sawed to insure a straight joint. Surface replacement shall match existing surfacing except as otherwise indicated on the Drawings. Where open excavation is allowed along or across public roadways, excavation, backfill, and surface replacement shall conform to the requirements of all permits applicable thereto. In no case shall surface replacement edges bear on less than 12" of undisturbed soil.

3.02 Preparation

- A. Identify required lines, levels, contours, and datum.
- B. Locate and identify existing utilities that are to remain and protect from damage.
- C. Notify utility companies to remove or relocate utilities that are in conflict with proposed improvements.
- D. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
- F. Prior to placing fill in low areas, such as previously existing ditches, ponds, or lakes, perform following procedures:
 - 1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain the same results.
 - 2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low area dry and undisturbed.
 - 3. If proposed for fill, muck, mud, and other materials removed from low areas shall be dried on-site by spreading in thin layers for observation by Engineer. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under building or pavement subgrade or within 10'-0" of perimeter of building subgrade or paving subgrade. If, after observation by Engineer, material is found to be unsuitable, unsuitable material shall be removed from site.

3.03 Sheeting, Shoring, and Bracing

- A. Furnish, install, and maintain, without additional compensation, sheeting, bracing, and shoring support required to keep excavations within the easement provided, to support the sides of the excavation, and to prevent any movement which may damage adjacent pavements or structures, damage or delay the work, or endanger life and health. Voids outside the supports shall be immediately filled and compacted.
- B. Sheeting, where required, shall be driven below the bottom of excavation so the lowest set of wales and struts are above the bottom of the excavation to allow necessary working room.
- C. The Engineer may direct in writing that supports in trenches be cut off at any specified elevation, in which case Contractor shall be paid for the supports left in place.
- D. Contractor may leave in place, to be embedded in the backfill of the excavation, any or all supports for the purpose of preventing injury to persons or property, whether public or private. However, no supports which are within 4' of the ground or pavement surface may be left in place without written permission of the Engineer. No extra payment will be made for supports left in place at the Contractor's option.
- E. All supports not left in place shall be removed in such manner as to avoid endangering the piping, structures, utilities or property, whether public or private. All voids left by the withdrawal of sheeting shall be immediately filled and compacted.
- F. The right of the Engineer to order supports left in place shall not be construed as creating an obligation on his part to issue such orders. Failure by the Engineer to exercise this right shall not relieve the Contractor from total liability for damages to persons or property resulting from the failure of the Contractor to leave in place sufficient supports to prevent any caving or moving of the ground adjacent to the excavation.

3.04 Excavation

- A. Do not excavate for any structure until that structure is scheduled for construction. Excavate only to the depth and dimensions necessary for the construction. Slope sides of excavations in accordance with OSHA requirements and the recommendations contained within the project geotechnical report.
- B. The bottom of all excavations shall be undisturbed earth unless otherwise indicated, and shall be approved by the Engineer before any subsequent work is started. Over excavate a minimum of 2 feet where excavations occur within unsuitable soils, and replace over excavated material with suitable soils.

- C. Excavations carried below depths indicated on the Drawings without the previous approval of the Engineer shall be filled with 2500 psi concrete or flowable fill to the correct level at the expense of the Contractor.
- D. Maintain excavations in good order. If the bearing capacity of the foundation soils is reduced because the excavation is allowed to remain open prior to commencing work, the weathered soil shall be removed and replaced with 2500 psi concrete or flowable fill at the Owner's discretion at the expense of the Contractor.
- E. All suitable materials removed from excavation areas shall be used for the project. Excess excavated suitable material shall be stockpiled on site at a location of the Owner's choosing, and shall become the property of the Owner, unless otherwise indicated on the Drawings.
- F. Suitable onsite excavated materials containing silty or slightly clayey to clayey fine sands shall be sufficiently dried by surface spreading and discing if necessary, or by mixing with cleaner fine sands prior to placement in fill areas.
- G. Unsuitable materials within the influence area of construction shall be excavated, removed from the site, and disposed, unless otherwise indicated on the Drawings.
- H. Excavations shall be kept dry, compacted, and stable to a depth two feet below the bottom of the excavation.
- I. If portions of the bottom of excavations consist of material unstable to such a degree that, in the opinion of the Engineer, it cannot adequately support the construction, the bottom shall be over excavated and stabilized with approved coarse granular stabilization material. Depth of stabilization shall be as directed by the Engineer. The initial 50 tons of stabilization shall be incidental to the Contract. Compensation will be allowed only for such additional quantities as the Engineer shall direct in writing to be placed.

3.05 Filling

- A. All fill material shall be suitable soils or flowable fill. Fill placed within 1 foot of structures shall not contain rock or stone larger than 2 inch diameter. If a sufficient quantity of suitable material is not available from other excavations within the site, provide additional suitable material or flowable fill.
- B. Fill within the influence area of roadways, structures, foundations, or slabs, shall be placed in layers of 8 inch loose depth. In all other areas, place fill in layers of 12 inch loose depth.
- C. Take necessary precautions not to cause settlement or damage to adjacent slabs, walls, structures, or foundations. Place fill materials evenly adjacent to structures, without wedging against structures.

- D. Where filling is required on both sides of structures, fill and compact simultaneously on opposite sides in even layers.

3.06 Compaction

- A. Unless otherwise indicated, the type of equipment and number of passes required to obtain the specified degree of compaction shall be determined at the site, subject to the approval of the Engineer.
- B. Provide mechanical compaction for cohesive material and vibratory compaction for granular materials, unless otherwise approved by the Engineer. Vibratory compaction is not allowed within 100 feet of existing structures. In these areas, compaction shall be accomplished by static means only. If compaction difficulties arise, the Engineer shall be consulted to review and possibly modify compaction procedures.
- C. Noncohesive soils shall be compacted with vibrating roller or equivalent; cohesive soils shall be compacted with sheeps-foot roller, pneumatic tamping, or approved equivalent, unless otherwise indicated.
- D. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

3.07 Testing and Cleanup

- A. Provide for testing and cleanup as soon as practicable, so these operations do not lag far behind pipe installation. Perform preliminary cleanup and grading operations immediately after backfilling.
- B. All surplus excavated material shall be disposed of by the Contractor.

3.08 Field Quality Control

- A. Minimum Density Requirement (ASTM D1557 or AASHTO T180):
 - 1. Fill placed under and within the influence area of roadways, structures, slabs, foundations = 98 percent
 - 2. Fill placed within pond and road embankment = 95 percent
 - 3. Fill placed within public road right-of-way and utility easements outside the road influence area = 95 percent
 - 4. Fill placed within landscape areas = 85 percent
 - 5. Fill placed within all other areas = 90 percent

Where fill is placed and differing density requirements are defined, the more stringent density requirement governs.

END OF SECTION

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SECTION 02320

TRENCHING, BEDDING, AND BACKFILLING

PART 1 - GENERAL

1.01 Section Includes

- A. Trenching for piping and electrical work.
- B. Excavation for manholes, junction boxes, meter vaults, and appurtenances.
- C. Sheeting, shoring and bracing
- D. Bedding, backfilling, and compaction.

1.02 Related Sections

- A. Section 02230 - Site Preparation
- B. Section 02240 - Dewatering
- C. Section 02310 - Finish Grading
- D. Section 02315 - Excavation and Fill
- E. Section 02370 - Erosion and Sedimentation Control

1.03 References

- A. American Association of State Highway and Transportation Officials (AASHTO) latest edition:
 - 1. AASHTO M145 - Classification of Soils and Soil Aggregate Mixtures
 - 2. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb Rammer and 18-in Drop
- B. American Society for Testing and Materials (ASTM) latest edition:
 - 1. ASTM D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort
 - 2. ASTM D2487 - Classification of Soils for Engineering Purposes
- C. Occupational Safety and Health Administration (OSHA) Regulations, including:
 - 1. Part 1926 Subpart P – Excavations

1.04 Definitions

- A. Bedding = Area from bottom of trench to centerline of pipe
- B. Backfill = material above the top of pipe to the topsoil, paving sub-grade, or foundation level.
- C. Influence Area = the area within lines sloped downward at 45 degrees from the outer edges of paving, foundations, and utility lines. As a minimum, the influence area shall extend 5 feet beyond the edge of pavement (where there is no curb) or 5 feet beyond the back of curb.

1.05 Quality Assurance

- A. Field density testing frequencies:
 - 1. One test for each 300 linear feet of pipeline or fraction thereof per lift of general backfilling in the pipeline trench. Where less than 300 linear feet of pipeline is installed, one test per lift of backfill is required, staggered along the pipeline at locations determined by the Engineer
 - 2. One test for each 100 square feet or fraction thereof of backfill around and under structures, with a minimum of two tests per lift.
 - 3. One test per lift per each change in type of fill.
- B. Sheeting, shoring, and bracing used for the support of excavations over 20 feet deep shall be designed by a professional engineer licensed by the State of Florida.

1.06 Preconstruction Requirements

Precondition surveys and vibration monitoring are required for those areas where residential structures are within 100 feet of the proposed construction.

PART 2 - PRODUCTS

2.01 General

It is intended that previously excavated materials conforming to the following requirements be utilized wherever possible.

2.02 Materials

- A. Acceptable materials (suitable material): AASHTO M145 classification A-1, A-3, A-2-4, A-2-6; ASTM D2487 classification GW, GP, GM, SM, SW, SP; unless otherwise disapproved within the Soil and Subsurface investigation reports. No more than 12 percent of acceptable materials shall pass the number 200 sieve.

- B. Unacceptable materials (unsuitable material): AASHTO M145 classification A-2-5, A-2-7, A-4, A-5, A-6, A-7, A-8; ASTM D2487 classification GC, SC, ML, MH, CL, CH, OL, OH, PT; unless otherwise approved within the Soil and Subsurface investigation reports.
- C. Flowable fill shall be "Excavatable" and shall meet the requirements of FDOT specification section 121, with a maximum 28-day compressive strength of 100 psi and a minimum 28-day compressive strength of 80 psi.

2.03 Sheeting, Shoring, and Bracing

- A. The structural strength and safety of all sheeting, shoring and bracing shall be the sole responsibility of the Contractor. Repair any damage resulting from failure to provide adequate supports.
- B. Provide timber-work, shoring, bracing, sheeting, and sheet piling where necessary to retain banks of excavations, prevent cave-in of adjacent ground, prevent displacement of utilities and structures, and to protect public safety.
- C. Contractor is solely responsible for the design, installation, and operation of dewatering systems and their safety and conformity with local codes and regulations.

PART 3 - EXECUTION

3.01 General Construction Requirements

- A. Provide suitable temporary drainage channels for any water that may flow along or across the work as specified hereafter.
- B. Provide barriers, warning lights and other protective devices at all excavations.
- C. Sidewalks, roads, streets, and pavements shall not be blocked or obstructed by excavated materials, except as authorized by the Engineer, in which case adequate temporary provisions must be made for satisfactory temporary passage of pedestrians, and vehicles. Minimize inconvenience to public travel or to tenants occupying adjoining property.
- D. Where necessary to place excavated material adjacent to buildings, erect barriers to keep earth at least 4 feet from such buildings. Earth deposited on lawns shall be promptly and carefully removed to preserve the turf. All trees, shrubs, and landscaping shall be protected. Boring and jacking shall be used, if necessary, except where written permission is granted to remove trees and shrubs.

- E. If open excavations cross existing rigid surfacing, the surfacing shall be removed for a width one foot beyond the anticipated edge of the excavation. The pavement break shall be sawed to insure a straight joint. Surface replacement shall match existing surfacing except as otherwise indicated on the Drawings. Where open excavation is allowed along or across public roadways, excavation, backfill, and surface replacement shall conform to the requirements of all permits applicable thereto. In no case shall surface replacement edges bear on less than 12 inches of undisturbed soil.

3.02 Preparation

- A. Identify required lines, levels, contours, and datum.
- B. Locate and identify existing utilities that are to remain and protect from damage.
- C. Notify utility companies to remove or relocate utilities that are in conflict with proposed improvements.
- D. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of the Owner. All benchmarks, property corners, and other survey monuments that are lost, damaged, or destroyed shall be replaced by a Licensed Surveyor at the Contractor's expense.

3.03 Sheeting, Shoring, and Bracing

- A. Furnish, install, and maintain, without additional compensation, sheeting, bracing, and shoring support required to keep excavations within the easement provided, to support the sides of the excavation, and to prevent any movement which may damage adjacent pavements or structures, damage or delay the work, or endanger life and health. Voids outside the supports shall be immediately filled and compacted.
- B. Sheeting, where required, shall be driven below the bottom of excavation so the lowest set of wales and struts are above the bottom of the excavation to allow necessary working room.
- C. The Engineer may direct in writing that supports in trenches be cut off at any specified elevation, in which case Contractor shall be paid for the supports left in place.

- D. Contractor may leave in place, to be embedded in the backfill of the excavation, any or all supports for the purpose of preventing injury to persons or property, whether public or private. However, no supports which are within 4 feet of the ground or pavement surface may be left in place without written permission of the Engineer. No extra payment will be made for supports left in place at the Contractor's option.
- E. All supports not left in place shall be removed in such manner as to avoid endangering the piping, structures, utilities or property, whether public or private. All voids left by the withdrawal of sheeting shall be immediately filled and compacted.
- F. The right of the Engineer to order supports left in place shall not be construed as creating an obligation on his part to issue such orders. Failure by the Engineer to exercise this right shall not relieve the Contractor from total liability for damages to persons or property resulting from the failure of the Contractor to leave in place sufficient supports to prevent any caving or moving of the ground adjacent to the excavation.

3.04 Trenching

- A. All excavations shall be made by open cut unless otherwise indicated. Sides of trenches shall be kept as nearly vertical as possible from the trench bottom to a level of one foot above the top of the pipe. Slope sides of trenches in accordance with OSHA requirements and the recommendations contained within the project geotechnical report.
- B. Excavation of trenches shall not advance more than 50 feet ahead of completed pipe installation except as approved by the Engineer.
- C. Excavate trenches to depth indicated or required for indicated flow lines and invert elevations. Over excavate trenches a minimum of 2 feet where excavations occur within unsuitable soils, and replace over excavated material with suitable soils.
- D. Where rock is encountered, carry excavation 6 inches below scheduled elevation and backfill with a 6 inch layer of crushed stone or gravel prior to installation of pipe.
- E. For pipes or conduit 5 inches or less, excavate to indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
- F. For pipes or conduit 6 inches or larger, and other work indicated to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6 inches below bottom of work to be supported.
- G. Except as otherwise indicated, excavate for pressure piping so top of piping is minimum 3 feet below finished grade.

- H. Unsuitable excavated materials shall be removed from the site and disposed, unless otherwise indicated on the Drawings.
- I. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
- J. Trench bottoms shall be kept dry, compacted, and stable to a depth two feet below the bottom of the trench.
- K. Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 9 -12 inch clearance on each side of pipe or conduit.
- L. If more than one pipe is to be installed in a trench, the pipes shall be spaced a minimum of one foot apart for pipes 4 inches and larger.
- M. If portions of the bottom of trenches consist of material unstable to such a degree that, in the opinion of the Engineer, it cannot adequately support the pipe or structure, the bottom shall be over excavated and stabilized with approved coarse granular stabilization material. Depth of stabilization shall be as directed by the Engineer. The initial 50 tons of stabilization shall be incidental to the Contract. Compensation will be allowed only for such additional quantities as the Engineer shall direct in writing to be placed.
- N. Do not backfill trenches until tests and inspections have been made.

3.05 Trench Backfilling

- A. Following placement of pipe and inspection of joints, install tamped bedding material. Place bedding fill materials in layers of 6-inch loose depth.
- B. All bedding and backfill material shall be suitable soils or flowable fill. Backfill material within 1 foot of pipe and appurtenances shall not contain rock or stone larger than 2-inch diameter. If a sufficient quantity of suitable material is not available from the trench or other excavations within the site, provide additional suitable material or flowable fill.
- C. After completion of bedding and preliminary approval of piping and testing, the pipe shall be covered to a point one foot above the top of the pipe for the full trench width, placed in layers of 8-inch loose depth.
- D. Place backfill over pipe. Where trench is within the influence area of roadways, structures, foundations, or slabs, place backfill in layers of 8-inch loose depth. In all other areas, place backfill in layers of 12-inch loose depth.
- E. Take necessary precautions not to cause settlement or damage to adjacent slabs, walls, structures, or foundations. Place backfill and fill materials evenly adjacent to structures, without wedging against structures or displacement of piping or conduit.

3.06 Minor Structural Excavation and Backfilling

- A. Minor structures are defined as manholes, junction boxes, inlets, valve vaults, and meter vaults. Do not excavate for any structure until that structure is scheduled for construction. Excavate only to the depth and dimensions necessary for the construction.
- B. The bottom of all excavations shall be undisturbed earth unless otherwise indicated, and shall be approved by the Engineer before any subsequent work is started. Over excavate a minimum of 2 feet where excavations occur within unsuitable soils, and replace over excavated material with suitable soils.
- C. Excavations carried below depths indicated on the Drawings without the previous approval of the Engineer shall be filled with 2500 psi concrete or flowable fill at the Owner's discretion to the correct level at the expense of the Contractor.
- D. Maintain excavations in good order. If the bearing capacity of the foundation soils is reduced because the excavation is allowed to remain open prior to commencing work, the weathered soil shall be removed and replaced with 2500 psi concrete or flowable fill at the Owner's discretion at the expense of the Contractor.
- E. Do not backfill until new concrete has properly cured, coatings have been approved, and any required tests have been accepted.
- F. Fill within the influence area of roadways, structures, foundations, or slabs, shall be placed in layers of 8-inch loose depth. In all other areas, place fill in layers of 12-inch loose depth.
- G. Exercise care during backfilling operations to avoid any puncture, break or other damage to waterproofing systems, if any. Backfill adjacent to waterproofing in the presence of the Engineer.
- H. Where backfilling is required on both sides of structures, backfill and compact simultaneously on opposite sides in even layers. Other backfilling sequences shall be as specifically noted.

3.07 Compaction

- A. Unless otherwise indicated, the type of equipment and number of passes required to obtain the specified degree of compaction shall be determined at the site, subject to the approval of the Engineer.
- B. Provide mechanical compaction for cohesive material and vibratory compaction for granular materials, unless otherwise approved by the Engineer. Vibratory compaction is not allowed within 100 feet of existing structures. In these areas, compaction shall be accomplished by static means only. If compaction difficulties arise, the Engineer shall be consulted to review and possibly modify compaction procedures.

- C. Noncohesive soils shall be compacted with vibrating roller or equivalent; cohesive soils shall be compacted with sheeps-foot roller, pneumatic tamping, or approved equivalent, unless otherwise indicated.
- D. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

3.08 Testing and Cleanup

- A. Provide for testing and cleanup as soon as practicable, so these operations do not lag far behind pipe installation. Perform preliminary cleanup and grading operations immediately after backfilling.
- B. All surplus excavated material shall be disposed of by the Contractor.

3.09 Field Quality Control

- A. Minimum Density Requirement (ASTM D1557 or AASHTO T180):
 - 1. Backfill placed under and within the influence area of roadways, structures, slabs, foundations = 98 percent
 - 2. Backfill placed within pond and road embankment = 95 percent
 - 3. Backfill placed within public road right-of-way and utility easements outside the road influence area = 95 percent
 - 4. Backfill placed within landscape areas = 85 percent
 - 5. Backfill placed within all other areas = 90 percent

Where backfill is placed and differing density requirements are defined, the more stringent density requirement governs.

END OF SECTION

SECTION 02370

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 Section Includes

Designing, providing, maintaining, removing temporary erosion and sedimentation controls.

1.02 Related Sections

- A. Section 01415 – Stormwater Pollution Prevention/NPDES Requirements
- B. Section 02230 - Site Preparation
- C. Section 02240 - Dewatering
- D. Section 02315 - Excavation and Fill
- E. Section 02320 - Trenching, Bedding, and Backfilling

1.03 References

- A. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, latest edition:
 - 1. Specification 300 - Prime and Tack Coats for Base Courses
 - 2. Specification 985 - Geotextile Fabrics
- B. State of Florida Erosion and Sediment Control Manual, latest edition.

1.04 Owner's Instructions / Sequencing

- A. Owner has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, trenching, borrow and embankment operations. Owner also has authority to direct Contractor to provide immediate permanent or temporary erosion and sediment control measures.
- B. Contractor shall respond to erosion and sediment control maintenance requirements or implement additional measures to control erosion ordered by Owner or governing authorities within 48 hours or sooner if required at no additional cost to the Owner.
- C. Contractor will be required to incorporate permanent erosion control features into project at earliest practical time to minimize need for temporary controls.

PART 2 - PRODUCTS

2.01 Erosion Control

- A. Seeding and Mulching
- B. Sodding
- C. Hydro-seeding
- D. Coarse Aggregate
- E. Prime Coat - Per FDOT Specification 300

2.02 Sedimentation Control

- A. Silt Fence - Per Details on the Drawings

PART 3 - EXECUTION

3.01 Erosion Control

- A. Maintain temporary erosion control systems as directed by Owner or governing authorities to control erosion and siltation during life of contract.
- B. The erosion and sediment control measures shown on the plans represent a minimum requirement. The Contractor is responsible for determining additional erosion and sediment control measures needed in order to prevent the transfer of sediment from the project area and prevent the erosion of surfaces during construction, as needed to protect adjacent properties and water bodies.
- C. Permanently grass cut slopes as excavation proceeds to extent considered desirable and practical as determined by the Owner.
- D. Grass all disturbed areas within 7 days of initial disturbance. Type of grassing shall be as follows: temporary grassing to be sodding at all drainage structures, retention areas, swales and ditches, and where slopes are steeper than 5:1. Temporary grassing can be seed and mulch at all other locations unless otherwise indicated in the drawings or specifications.
- E. Erosion control of areas to be paved shall meet the following:
 - 1. Install subgrade and base course materials within 48 hours of the removal/open cutting of existing pavement consisting of streets, driveways, or sidewalk. Install final surface courses within 14 days after removal of existing pavement.
 - 2. Areas to receive asphalt shall receive erosion control measures no later than 48 hours after installation of base course. Temporary erosion control consists of placement of a bituminous prime coat and sanding the surface. Permanent erosion control consists of placement of the structural course.

- 3. Areas to receive concrete paving shall be either protected with a layer of FDOT coarse aggregate material or shall be paved within 48 hours of installation of the subgrade.
- F. Dirt roads are to be stabilized and compacted within 7 days of the completion of trenching and grading activities.

3.02 Sedimentation Control

- A. Install prior to construction.
- B. Inspect every two weeks during construction.
- C. Remove any sediment build-up.
- D. Repair and reinstall any damaged or missing sediment control measures. Install additional measures if inspection reveals additional sedimentation control is necessary.
- E. Rough excavate and grade any proposed stormwater ponds at the start of site grading activities. Direct site runoff to the ponds to minimize runoff to offsite areas.

END OF SECTION

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SECTION 02740

PAVING

PART 1 - GENERAL

1.01 Section Includes

- A. Asphalt pavement, including binder and surface course.
- B. Repair and restoration of existing paving, curbing, driveways, and sidewalks.
- C. Paving and temporary paving timing requirements.

1.02 References

- A. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, latest edition:
 - 1. Section 334 - Superpave Asphalt Concrete

1.03 Submittals

Submit proposed design mix for review and approval. Submit for each proposed mix the following: Gradation analysis; proposed asphalt binder.

1.04 Quality Assurance

- A. Field compaction density and thickness testing frequencies of the asphalt shall be tested once every 200 linear feet of paving per 24-ft wide strip, staggered left, center and right of centerline. Where less than 200 linear feet of asphalt is placed in one day, provide minimum of one test for each per day's construction at a location designated by the Engineer.
- B. Asphalt extraction gradation shall be tested from grab samples collected once every 1800 square yards of asphalt delivered to the site, or a minimum of once per day. Obtain the results in a timely manner (no later than the end of the day) so that adjustments can be made if necessary.
- C. All other testing requirements and acceptance criteria shall be in accordance with FDOT specifications.

1.05 Project Conditions

- A. Apply asphalt in accordance with FDOT requirements. Do not apply when the base is wet, contains excess moisture, or during rain.

- B. Do not spread the mixture when the wind is blowing to such an extent that proper and adequate compaction cannot be maintained or when sand, dust, etc., are being deposited on the surface being paved to the extent that the bond between layers will be diminished.

PART 2 - PRODUCTS

2.01 General

The superpave mix and thickness shall be in accordance with the construction notes.

PART 3 - EXECUTION

3.01 General

All installation and testing procedures shall be in accordance with FDOT requirements, except for the frequency of testing outlined herein and measurement and payment requirements of section 01270.

END OF SECTION

SECTION 02910

LANDSCAPING

PART 1 - GENERAL

1.01 Section Includes

Materials, installation, maintenance of trees, ground cover, and shrubs

1.02 Related Sections

Section 02920 – Lawns and Grasses

1.03 General Requirements

- A. Furnish all labor, materials, equipment, and incidentals required to install trees, ground cover, and shrubs, to place accessory planting materials and to maintain and guarantee all planted areas, in areas as shown on the Drawings. All work shall be in strict adherence with sound nursery practice and shall include maintenance and watering of all the work of this Contract until final completion and acceptance by the Owner.
- B. The landscaping shall be performed by a subcontractor who is fully experienced in projects of this scope and whose main business is landscaping. The subcontractor shall be subject to the approval of the Engineer.
- C. Provide under this Section all landscaping appurtenances as shown on the landscaping drawings and specifications.

1.04 Submittals

- A. Submit to the Engineer for approval, complete written maintenance instructions for each type of plant furnished under the Contract.
- B. Submit representative samples of any or all of required accessory planting materials as ordered by the Engineer.
- C. All trees, shrubs and sod shall have a valid and current state of Florida, Division of Plant Industry (DPI) inspection certification prior to being transported to the construction site. Submit the DPI certification to the Engineer and maintain a copy of the certification onsite with the construction records.

1.05 Warranty

The life and satisfactory condition of all plant material planted shall be guaranteed by the Contractor for a minimum of one calendar year. Guarantee shall include complete replacement with material of the same kind and size as in the original work if not in a healthy condition, as determined by the Engineer, at the end of the warranty period.

1.06 Maintenance

- A. Plant material maintenance shall begin when planting operations start and shall extend until final acceptance of the work.
- B. Maintain all plant materials under this Contract to the satisfaction of the Engineer. Maintenance shall include necessary watering, cultivation, weeding, pruning, spraying, tightening and repair to guy wires, removal of dead material, resetting, and other work required to conform with referenced standards and accepted nursery standards as approved.
- C. Plant materials which are in a tilted or in a leaning position shall be properly righted
- D. After final acceptance by the Owner and until 120 days after acceptance of all plantings, the landscaping subcontractor shall make monthly inspections of materials and report in writing to the Engineer the conditions of the plants and the necessary requirements to keep the plants in a healthy growing condition.

PART 2 - PRODUCTS

2.01 Materials

- A. Plant species and size shall conform to those indicated in the Plant List and in plant locations shown on the Drawings. All plants shall be Florida Grade No. 1, or better.
- B. Plants shall be sound, healthy, vigorous, free from plant diseases, insects, pest, or their eggs, and shall have healthy normal root systems. Plants shall be nursery grown stock, freshly dug. No heeled in, cold storage or collected stock will be acceptable.
- C. Shape and Form:
 - 1. Plant material shall be symmetrical, typical for the variety and species, and shall conform to the measurements specified in the Plant List.
 - 2. Plants used where symmetry is required shall be matched as nearly as possible.
 - 3. Plants shall not be pruned prior to delivery except as authorized.
 - 4. All plants shall have been transplanted or root pruned at least once in the past 3 years.
 - 5. Unless otherwise noted, street trees shall be free of branches up to 6 feet, with the single leader well branched, and with straight trunks.
 - 6. Shrubs shall have been twice transplanted, have fully developed root systems, be heavily canned with foliage to base, fulfill dimensions required, and be typical of the species.
 - 7. Ground covers shall have sturdy fibrous root systems and shall be heavily leafed.

- D. Measurement: The height and/or width of trees shall be measured from the ground or across the normal spread of branches with the plants in their normal position. The measurement shall not include the immediate terminal growth.
- E. Substitutions in plant species or size shall be made only with the written approval of the Engineer.
- F. Ground cover plants shall be planted in beds which receive 4 inches of approved topsoil, thoroughly disced into the soil. The finished surface, compacted and settled, shall conform generally with and at all points to the required grade. Plants shall be spaced as shown, and in accordance with the best practices of the trade.
- G. Planting Soil:
 - 1. Soil for backfilling around plants and planting beds shall be a good grade of garden loam as approved. Soil shall be free of heavy clay, coarse sand, stones, lumps, sticks or other foreign material. The soil shall not be delivered or used in a muddy condition.
 - 2. The soil shall be taken from ground that has never been stripped. There shall be a slight acid reaction to the soil with no excess of calcium or carbonate. The soil shall be free from excess weeds or other objectionable material.
 - 3. Soil for trees and shrubs shall be delivered in a loose, friable condition. All trees should average approximately 1 cubic yard per tree. There will be 4-inches of planting soil in ground cover areas and 1/8 cubic yard per shrub or vine.
 - 4. No marl shall be used in ground cover planting beds.
- H. Any required landscaping stone shall be inert, nonleaching material as specified on the Drawings. Provide physical samples for approval before purchase. No crushed limerock shall be used.

PART 3 - EXECUTION

3.01 Planting Procedures

- A. Plant Locations: All plants shall be located as shown on the Drawings, to dimensions if shown, to scale if not dimensioned. Large areas or beds shall be scaled and the plants spaced evenly. Approval by the Engineer is required before any plants are installed.
- B. Tree Staking: All tree staking and bracing shall be included herein in accordance with sound nursery practice and shall generally be in accordance with the details shown. Furnish all materials required for staking and bracing as approved.

- C. Tree Pits: Pits for trees shall be at least 2 feet greater in diameter than the specified diameter of the ball. Pits shall be of sufficient depth to allow a 6-inch layer of planting soil under the ball when it is set to grade. Bottom of pit shall be loosened prior to backfilling. Other specifications for tree pits shall be as shown on the plans.
- D. Digging and Handling:
 - 1. Plants shall be handled at all times so that roots or balls are adequately protected from sun or drying winds. Tops or roots of plants allowed to dry out will be rejected.
 - 2. Balled or burlapped plants shall be moved with firm, natural balls of soil, not less than 1-foot diameter of ball to every 1-inch caliper of trunk, and a depth of not less than 2/3 of ball diameter. No plant shall be accepted when the ball of earth surrounding its roots has been cracked or broken. All trees, except palm and seedling pines, shall be dug with ball and burlapped. Root pruning shall have been done a minimum of four weeks before planting at the job.
 - 3. Bare root plants shall be dug with spread of root and of sufficient depth to ensure full recovery of the plant.
- E. When balled and burlapped plants are set, planting soil shall be carefully tamped under and around the base of the balls to prevent voids. All burlap, rope, wires, etc., shall be removed from the sides and tops of balls, but no burlap shall be pulled from underneath. Roots of bare rooted plants shall be properly spread out and planting soil carefully worked in among them.
- F. Before plants are backfilled with planting soil, fertilizer tables, Agriform 20-10-5 or equal, shall be placed in each pit. Provide three tablets for each tree and one for each shrub or vine.
- G. All plants shall be set straight or plumb, in locations shown on the Drawings. Except as otherwise specified, plants shall be planted in pits and shall be set at such level that, after settlement, they bear the same relation of the finished grade or surrounding ground as they bore to the grade of the soil from which they are taken.
- H. Pruning shall be carefully done by experienced plantsmen. Prune immediately upon acceptance by the Owner, including any broken branches, thinning all small branches and tipping back main branches (except main leaders).
- I. Excess soil and debris shall be disposed of off the project site unless ordered stockpiled by the Engineer.

3.02 Obstructions Below Ground

- A. If underground construction utilities or obstructions are encountered in excavation of the planting areas, or pits, other locations for the plant material may be selected by the Engineer.

- B. Such changes shall be done without additional compensation.

3.03 Tree and Plant Protection

- A. The Contractor shall remove only those trees selected for removal by the Engineer. Prior to removal of said trees, the Contractor shall obtain a tree removal permit, if required. All other trees in the vicinity of the work shall be protected against damage by the Contractor until all work under the Contract has been completed.
- B. Consult with the Engineer, and remove agreed-on roots and branches which interfere with construction. Employ qualified tree surgeon to remove, and to treat cuts.
- C. Provide temporary barriers to the height of six feet (6-foot/0-inches), around each, or around each group of trees and plants.
- D. Protect root zones of trees and plants:
 - 1. Do not allow vehicular traffic or parking.
 - 2. Do not store materials or products.
 - 3. Prevent dumping of refuse or chemically injurious materials or liquids.
 - 4. Prevent puddling or continuous running water.
- E. Carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage.
- F. In case of inadvertent damage to any tree, by the Contractor or any of his subcontractors or employees, the Contractor shall provide replacement of each size tree with a new tree of acceptable type, size and quality, subject in each case to the approval of the Owner.
- G. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by the Engineer.
- H. Clean and repair damage caused by installation, fill and grade the areas of the site to required elevations and slopes, and clean the area.

3.04 Replacement

- A. At the end of the warranty period, any plant required under this Contract that is dead or not in satisfactory growth as determined by the Engineer shall be removed. Plants replaced shall be guaranteed for 90 days after date of replacement.
- B. Replacement of plants necessary during the guarantee period shall be the responsibility of the Contractor, except for possible replacements of plants resulting from removal, vandalism, acts of neglect on the part of others, or acts of God.

- C. All replacements shall be plants of the same kind and size as specified in the landscape drawings. They shall be furnished and planted as herein specified. The cost shall be the responsibility of the Contractor.

END OF SECTION

SECTION 02920

LAWNS AND GRASSES

PART 1 - GENERAL

1.01 Section Includes

Soil preparation, sodding, seeding, mulching, fertilizing, watering, and maintenance of grassed areas

1.02 References

Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest implemented edition.

1.03 Submittals

- A. All sod shall have a valid and current state of Florida, Division of Plant Industry (DPI) inspection certification prior to being transported to the construction site. Submit the DPI certification to the Owner and maintain a copy of the certification onsite with the construction records.
- B. Tickets from each sod pallet of sod delivered to the site shall be provided to the Owner. The tickets are to identify the sod type, the sod farm (source) of the sod, and the date the sod was cut.
- C. Provide signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed.

1.04 Quality Assurance

- A. Sod shall be no more than 10% brown per piece of sod when delivered to the site and shall be free of weeds and other grass contamination.
- B. Sod shall be delivered to the site no more than 48 hours after it has been cut and shall be installed upon delivery. Sod shall be fresh and uninjured.
- C. Sod shall have a soil mat of sufficient thickness adhering firmly to the roots in order to withstand all necessary handling.

1.05 Delivery, Storage, and Handling

- A. Sod delivered to the site shall be in pallets, with sod pieces generally 16-inches by 24-inches (+/-) with no sod piece smaller than 12-inches on any side.
- B. Sod delivered to the site shall be kept out of direct sunlight and shall be kept moist until installation.
- C. Sod not meeting these specifications upon delivery as determined by the Owner shall be removed from the project site and not installed.

1.06 Warranty

All seeding shall be warrantied by the General Contractor to be true to name and in a vigorous growing condition through one growing cycle including one summer and one winter season.

1.07 Certification

Sod shall have a valid and current State of Florida, Division of Plant Industry (DPI) inspection certification prior to being transported to the construction site.

1.08 Maintenance

- A. Maintenance for lawns shall begin immediately after seeding or sodding. Provide fertilizing, watering, mowing and replanting and continue as necessary until a close healthy stand of specified grasses is established.
- B. Mowing and watering shall be continued until project completion as directed by the Owner.

PART 2 - PRODUCTS

2.01 Lime

Lime shall be agricultural grade dolomitic limestone, ground sufficiently fine so that at least 80 percent will pass through a No. 8 sieve, and it shall contain not less than 80 percent calcium carbonate equivalent. Moisture content at time of delivery shall not exceed 8 percent.

2.02 Fertilizer

Fertilizer shall be a composition recommended by a local County Agricultural Agent or State Agricultural Extension Service or a preformulated 10-6-4 mixture.

2.03 Water

Water shall be free from oil, acid, alkali, salts, and other harmful substances.

2.04 Sod

- A. Sodding is to match existing adjacent lawns and shall be well matted with grass roots.
- B. Sod shall be either field or nursery grown sod that is native to the locality of the Project. The Contractor shall obtain the Owner's approval of the source of the sod prior to cutting the sod.
- C. Sod grown on soil high in organic matter, such as peat, will not be acceptable. The consistency of sod shall be such that it will not break, crumble or tear during handling and placing. Sod shall be reasonably free of stones, crab grass, noxious weeds, and other objectionable plants or substances injurious to plant growth.
- D. Sod shall have at least 1 inch of soil adhering firmly to the roots and cut in rectangular pieces with the shortest side not less than 12 inches. At the time of cutting sod the grass shall be mowed to a height not less than 2 inches nor more than 4 inches.
- E. Sod cut for more than 48 hours shall not be used without the approval of the Owner.
- F. Bermuda Sodding shall be 419 Tifway Bermuda.
- G. Bahia Sodding shall be Argentine Bahia Sod.
- H. If so designated on the drawings, Bahia Sodding along coastal areas subject to high salt content shall be Seashore Paspalum Bahia (*Paspalum vaginatum*), such as Sea Isle 1, as produced by Turfgrass America, or approved equal.
- I. St. Augustine sodding is to be provided in those areas where the adjacent sod is St. Augustine sod.

2.05 Seed and Mulch

- A. Permanent grass seed shall be scarified argentine bahia, in accordance with FDOT specification 981.
- B. Temporary grass seed shall be annual rye grass in accordance with FDOT specification 981.
- C. Mulch shall be dry mulch in accordance with FDOT specification 981.

PART 3 - EXECUTION

3.01 General

- A. All grassing, whether temporary or permanent, will be inspected by the Owner or the Owner's representative at the time of installation or shortly thereafter to determine whether it is acceptable in accordance with these specifications. Any sod found to be unacceptable shall be removed and replaced with new sod within 48 hours (prior to root establishment) as directed by the Owner.
- B. Grassed areas will be inspected by the Owner or the Owner's representative throughout the construction period, not just at project completion. Any established sod subsequently found to be unacceptable shall be removed and replaced with new sod within 7 calendar days as directed by the Owner.

3.02 Timing Requirements

- A. Grass all disturbed areas, whether temporary or permanent grassing, within 7 days of initial disturbance.
- B. Permanently grass disturbed areas after all required testing is complete.

3.03 Regrading of Topsoil

Topsoil shall be graded reasonably smooth and level after final settlement. All humps shall be removed and depressions or eroded areas filled in with additional topsoil before proceeding with seeding or sodding.

3.04 Preparation for Sodding or Seeding

- A. Preparation shall not be started until all other site and utility work and finished grading within the areas to be seeded have been completed.
- B. Loosen topsoil by tilling it to a depth of at least 3 inches and smooth out all surface resulting irregularities. Leave area free of rocks or hard soil clods that will not pass through the tines of a standard garden rake.
- C. At least 7 days before applying fertilizer, spread lime uniformly in sufficient quantity to produce a soil pH of 6.5. Work lime thoroughly into topsoil to a depth of 3 inches.
- D. Apply fertilizer uniformly at a rate of 20 pounds per 1000 square feet. Work fertilizer into soil prior to seeding or sodding.
- E. The area over which sod is to be placed shall be scarified or loosened to a depth of 2 inches and then raked smooth and free of debris.
- F. The area shall be graded as needed to ensure the new sod matches the existing sod grade.

3.05 Sodding

- A. Sodding operations shall follow immediately behind operations for the preparation of the areas for sodding and shall generally take place on the same day.
- B. Provide sod in areas indicated on the Drawings. Generally, all disturbed areas are to be sodded except for those areas specifically identified to be seeded and mulched or hydroseeded. Sodding shall also be used in ditches and drainage swales and on all embankment slopes steeper than 3 to 1 unless protection is provided against erosion of seeding.
- C. Sod which has been cut for more than 72 hours prior to installation shall not be used unless specifically authorized by the Owner.
- D. Place sod with the edges in close contact and alternate courses staggered. Lightly tamp or roll to eliminate air pockets. On slopes 2 to 1 or steeper, stake sod with not less than 4 stakes per square yard and with at least one stake for each piece of sod. Stakes shall be driven with the flat side parallel to the slope.
- E. Do not place sod when the ground surface is frozen or when air temperature may exceed 90 degrees F. Sodding shall not be performed when weather and soil conditions are, in the Owner's opinion, unsuitable for proper results.
- F. In ditches, the sod shall be placed with the longer dimension perpendicular to the flow of water in the ditch. On slopes, starting at the bottom of the slope, the sod shall be placed with the longer dimension parallel to the contours of the ground. In order to prevent vertical edges at the outer limits, the outer pieces of sod shall be tamped into place.
- G. Any voids shall be sanded prior to watering and rolling.
- H. Upon completion of the sodding, the entire area shall be rolled thoroughly with the equipment specified. The area shall be rolled, then watered, and then rolled a second time providing a total of two trips over the entire area that has been sodded.

3.06 Seeding and Mulching

- A. Scatter seed uniformly over the grassing area while the soil is still loose and moist at the rate of 100 pounds per acre.
- B. Seed of quick growing species of grass, such as rye, Italian rye, millet or other cereal grass, shall be spread in conjunction with the permanent type seed mixture. The type of quick-growth seed used shall be appropriate to provide an early ground cover during the particular season when planting is done. The rate of spread shall be 30 pounds per acre, unless otherwise specified.

- C. Apply approximately 2 inches, loose thickness, of the mulch material uniformly over the seeded area, and cut into the soil so as to provide an early ground cover during the particular season when planting is done. The rate of spread shall be 30 pounds per acre, unless otherwise specified.
- D. Roll thoroughly the entire seeded area immediately after completion of the seeding.

3.07 Hydroseeding

- A. Hydroseeding shall result in an application of 7 pounds of seed per 1000 square feet.
- B. Mulch material is not required in the areas to be hydroseeded.
- C. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.
- D. The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 pounds per square inch (690 kPa). The pump shall be mounted in a line that will re-circulate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8-inch (15 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.
- E. The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium range ribbon nozzle, and one a long range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick release couplings.
- F. In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

- G. Lime, if needed, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.
- H. All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Owner all sources of water at least 2 weeks prior to use. The Owner may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the Owner following such tests.
- I. All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Owner.
- J. Lime, if needed, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (8 cm), after which the seedbed shall again be properly graded and dressed to a smooth finish.
- K. Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.
- L. Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.
- M. After the soil has dried, rake and roll the seeded areas.

3.08 Watering

Immediately after placing erosion control or mulch, water seeded areas thoroughly with a fine mist spray. Keep soil thoroughly moist until seeds have sprouted and achieved a growth of 1 inch. For sod, immediately begin watering and continually keep moist until the sod has firmly knit itself to the topsoil.

3.09 Protection of Work

Protect newly seeded and sodded areas from all traffic by erecting temporary fences and signs. Protect slopes from erosion. Properly and promptly repair all damaged work when required.

3.10 Application of Fertilizer

Six weeks after completion of seeding or sodding apply granular fertilizer over all areas at the rate of two pounds of nitrogen nutrients per 1000 square feet of area.

3.11 Turf Establishment

- A. Any sod that is more than 10% brown and has not become green within 14 calendar days of installation shall be re-sodded as directed by the Owner.
- B. Any sod that does not have root establishment (can be pulled up by hand) 14 calendar days or more after installation shall be re-sodded as directed by the Owner.
- C. All bare spots larger than 1 square foot shall be re-grassed as directed by the Owner.
- D. Any bare areas compromising more than 1% of any given 1000 square foot area shall be re-grassed as directed by the Owner.
- E. For the re-grassing, areas that were sodded are to be re-sodded and areas that were seeded are to be re-seeded.
- F. Scattered bare spots, none of which is larger than one square foot, will be allowed up to a maximum of 3% of the total area.
- G. Except for factors caused by a third party (other than the Contractor, subcontractor or supplier for the project), all re-grassing or repair of washed out and eroded areas shall be at no additional cost to the Owner.
- H. Grassed areas not showing a close uniform stand of healthy specified grasses at the time of substantial completion shall be replaced and maintained until final payment is made to the Contractor.

3.12 Clean-Up

At the time of final inspection of work, but before final acceptance, remove from seeded and sodded areas all debris, rubbish, excess materials, tools, and equipment.

END OF SECTION

SECTION 03100
CONCRETE FORMS

PART 1 GENERAL

1.01 Section Includes General Requirements for:

General formwork, forms, form liners and coatings, and form ties

1.02 Related Sections

A. Section 03150 - Concrete Accessories

1.03 References

A. American Concrete Institute (ACI) latest edition:

1. ACI 301 - Structural Concrete for Buildings
2. ACI 318 - Building Code Requirements for Reinforced Concrete
3. ACI 347 - Guide to Formwork for Concrete
4. ACI SP-4 - Formwork for Concrete

1.04 System Description

A. Provide formwork to produce members of the size, shape, and exterior finish required, for the structural adequacy of the forms to carry construction loads without excessive deflection, and for the safe use of forms in connection with completion of the concrete work. The Contractor shall be responsible for any injury or damage arising from inadequate forms or from premature removal of formwork.

1.05 Submittals

- A. Submit samples of patterned concrete form liner panels and form ties.
- B. Submit formwork shop drawings prepared by a licensed professional ENGINEER in the State of Florida to the A/E for record purposes only. Shop drawings shall indicate layout, materials and formwork capacities.

PART 2 PRODUCTS

2.01 Formwork

- A. Form ties shall be a watersealing snap-in type. For patterned concrete, use stainless steel snap ties.
- B. Plywood forms and liners shall be minimum grade B-B High Density Overlay Concrete Form Panels, Class I.

- C. Formwork lumber shall be straight and clean. All nails shall be withdrawn and surfaces in contact with concrete shall be thoroughly cleaned before reuse
- D. Metal forms shall be in accordance with ACI SP-4.

2.02 Patterned Concrete Form Liners

- A. Special liners shall be configured in such a manner as to produce patterned finish concrete that will duplicate the surface appearance of the cut limestone building panels. The location, extent, and configuration of the surface treatment shall be as indicated on the Drawings. In addition to form release agents, rustication may be slightly beveled, approximately 1 to 8 maximum, to facilitate form release.
- B. Produce the patterned concrete with a smooth finish by using either plywood and/or tempered hardboard, complying with requirements for Grade A Forms, in conjunction with finished lumber, or approved fiberglass liners; or an approved equal liner. Liner joint marks shall not be apparent.

PART 3 EXECUTION

3.01 General

- A. Coordinate with other trades and properly place and locate in position all necessary dowels, bolts, anchors, anchor slots, inserts, sleeves, openings, hangers, metal ties and other fastening devices required for attachment and support of adjacent work. Securely anchor all embedded items.
- B. Formwork shall comply with ACI 347 and to shape, lines and dimensions of the members as indicated on the Drawings. Joints in forms shall be horizontal or vertical. Forms shall be properly braced or tied to maintain position and shape under all dead and live loads and to prevent leakage. Forms shall be assembled so their removal will not damage the concrete. Tolerances for formed surfaces shall be in compliance with ACI 301.
- C. Lumber formwork may be used for surfaces which will not be exposed to view. Use plywood or metal forms for exposed surfaces.
- D. Provide temporary openings at the base of forms greater than 4 feet high, if necessary, to facilitate cleaning and inspection immediately before depositing concrete.
- E. All external corners of concrete exposed to view shall be chamfered by using 3/4 inch by 3/4 inch by 45 degree wood stripping, except as otherwise indicated on the Drawings.

3.02 Grade A Forms

- A. Unless otherwise indicated, Grade A forms shall be used for all exposed concrete.
- B. Grade A forms shall consist of steel forms lined with 3/16 inch thick tempered hardboard or 1/4 inch thick plywood, or by using plywood forms.
- C. Full sized sheets shall be used wherever possible. The edges of all sheets shall be straightened to insure tight, close fitting joints. Bulges or depressions more than 1/8 inch in 4 feet will not be permitted. Open joints which would permit leakage shall be sufficient cause for rejection of forms. Other tolerances shall be as allowed by ACI 347.

3.03 Grade B Forms

- A. Use lumber, plywood or metal forms. All joints shall be solidly backed, aligned and made leakproof.
- B. Unless otherwise indicated, Grade B Forms are intended for use where concrete will not be exposed to view, such as below grade, below normal liquid levels in water-retaining structures, or inside manholes, boxes, vaults, etc.

3.04 Surface Treatment of Formwork

- A. The inside surface of lumber forms shall be soaked with clean water prior to placing concrete. All other forms shall be treated with an approved form oil or lacquer. If oil is used, all excess oil shall be wiped off.

3.05 Inspection of Formwork

- A. Concrete shall not be placed until the forms have been inspected by the E/A to assure surfaces in conformance with the Drawings and Specifications. The inspection of formwork by the E/A does not relate to the structural adequacy or the safety of the formwork.

3.06 Removal of Forms

- A. Forms shall be removed in accordance with requirements of ACI 318, without damaging the concrete. Leave shoring in place until concrete will safely support its own weight plus any live loads that may be placed upon it.

END OF SECTION

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SECTION 03150
CONCRETE ACCESSORIES

PART 1 GENERAL

1.01 Section Includes General Requirements for:

Construction joints, waterstops

1.02 Related Sections

- A. Section 03100 - Concrete Forms
- B. Section 07900 - Joint Sealants

1.03 American Iron and Steel Requirements

- A. All of the iron and steel products used on this project are to be produced in the United States, subject to the American Iron and Steel.
- B. The term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

1.04 References

- A. American Society for Testing and Materials (ASTM) latest edition:
 - 1. ASTM D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
 - 2. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

1.05 Submittals

- A. Provide samples and certifications of all proposed materials.
- B. Certification from the manufacturer that its proposed iron and steel products are produced in the United States and are in compliance with the requirements in H.R. 3547, "Consolidated Appropriations Act, 2014," (Appropriations Act).

PART 2 PRODUCTS

2.01 Joint Fillers

- A. Joint fillers shall be products of the following manufacturers, or equal

1. W. R. Meadows, Inc., Elgin, Illinois
 2. W. R. Grace and Co., Cambridge, Massachusetts
- B. Preformed sponge rubber joint filler shall conform to ASTM D1752, Type I.
- C. Preformed cork joint filler shall conform to ASTM D1752, Type II.
- D. Preformed bituminous fiber joint filler shall be non_extruding type conforming to ASTM D1751.
- E. Control joint strips shall have a minimum depth of 25 percent of slab thickness and a minimum thickness of 1/8 inch.

2.02 Joint Sealants

- A. Sealants for joints shall be in accordance with Section 07900.

2.03 Waterstop

- A. Waterstop shall be either rubber (SBR or Neoprene) or PVC and shall be dense, homogeneous and uniform. PVC is preferred. Holes and imperfections shall be cause for rejection.
- B. Waterstops for construction joints shall be 4 inch by 3/16 inch minimum split waterstop or 6 inch by 3/8 inch minimum with hollow center bulb. Waterstops for expansion joints shall be 9 inch by 3/8 inch with 3/4 inch hollow center bulb. Multiple rib type of waterstop is preferred, if available. Where size and type of waterstop are not indicated, 6 inch by 3/8 inch minimum with hollow center bulb shall be used.
- C. Provide prefabricated tees, crosses, and other configurations as required for all intersections of waterstop.

PART 3 EXECUTION

3.01 Preparation

- A. Remove existing concrete and provide openings for installation of new work as indicated on Drawings. Repair all damage to existing work caused by concrete removal.

3.02 General

- A. Arrange construction joint bulkheads to allow concrete to be placed between construction joints in one continuous operation.

- B. Provide construction joints with shear transfer keyways and waterstops as indicated. Unless otherwise indicated on the Drawings, spacing of construction joints for walls shall not exceed 75 feet.
- C. Erect bulkheads where shown on the Drawings or where approved by the E/A. Bulkheads shall be at right angles to the main reinforcement and shall produce a tongue and grooved joint of the configuration indicated on the Drawings. Install waterstop as indicated.
- D. Obtain the E/A's approval if it becomes necessary to eliminate or relocate construction joints shown on the Drawings.
- E. Tops of edge forms, bulkheads and screeds shall be set to the finished elevations and to provide uniform pitch to drains as indicated on Drawings.

3.03 Horizontal Joints

- A. Provide methods of achieving a leakproof joint. No horizontal construction joints will be permitted in slabs, beams, or girders.

3.04 Vertical Joints

- A. Joints in reinforced slabs, beams, and girders shall be perpendicular to the axis or plane of the members joined.

3.05 Expansion Joints

- A. Provide expansion joints and waterstops where indicated. Joint fillers shall be placed on each side of waterstops.
- B. Unless otherwise indicated, provide preformed sponge rubber or preformed cork filler. Allow for installation of two component traffic grade polyurethane sealant in compliance with Section 07900.
- C. For drives, pavements, parking areas, walks and slabs on grade, provide preformed non-extruding asphalt strip or bituminous fiber joint filler set 1/8_inch below finished surface unless otherwise indicated. Tool concrete edges on each side of joint. No sealant is required.
- D. Unless otherwise indicated, provide preformed sponge rubber or cork filler with allowance for installation of two-component polysulfide sealant in compliance with Section 07900.

3.06 Waterstops

- A. Provide continuous waterstops where so indicated on the Drawings.

- B. Embed approximately half of the waterstop on each side of the joint. Field splice and joint PVC waterstop by heat sealing butt joints. Rubber waterstop shall be spliced or jointed with solid web rubber unions and the manufacturer's approved cold applied cement.
- C. All splices and joints shall be in accordance with the manufacturer's recommendations to produce a water-tight joint. Lap splices will not be permitted. Support and protect the waterstop during construction. Repair or replace all damaged waterstop.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 Section Includes General Requirements for:

Formwork, reinforcement, accessories, and cast-in-place concrete.

1.02 References

A. American Concrete Institute (ACI) latest edition:

1. ACI 301 - Structural Concrete for Buildings
2. ACI 305 - Hot Weather Concreting
3. ACI 306 - Cold Weather Concreting
4. ACI 315 - Detailing Manual
5. ACI 318 - Building Code Requirements for Structural Concrete
6. ACI 347 - Formwork for Concrete

B. American Association of State Highway and Transportation Officials (AASHTO) latest edition:

1. AASHTO T152 - Air Content of Freshly Mixed Concrete by the Pressure Method

C. American Society for Testing and Materials (ASTM) latest edition:

1. ASTM A185 - Steel Welded Wire Reinforcement, Plain, for Concrete
2. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. ASTM C31 - Making and Curing Concrete Test Specimens in the Field
4. ASTM C33 - Concrete Aggregates
5. ASTM C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens
6. ASTM C94 - Ready-Mixed Concrete
7. ASTM C138 - Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
8. ASTM C143 - Test Method for Slump of Hydraulic Cement Concrete
9. ASTM C150 - Portland Cement
10. ASTM C173 - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
11. ASTM C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
12. ASTM C260 - Air-Entraining Admixtures for Concrete
13. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete

14. ASTM D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Bituminous Types)

1.03 Submittals

- A. Submit reinforcement steel shop drawings prepared in accordance with ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures. Drawings shall indicate bending diagrams, shapes, dimensions, clearances, splicing and laps, accessories, and installation notes.
- B. Submit manufacturer's literature for all admixtures proposed for the work.
- C. Submit delivery tickets in accordance with ASTM C94 for each batch of ready-mixed concrete. Information on the ticket shall include class of concrete, water content, time of loading, truck number, admixtures, and quantity.
- D. At least 35 days prior to placing of concrete, the Contractor shall submit proposed mix proportions and samples of proposed materials.

1.04 Quality Control

- A. Materials and methods of mixing and placing concrete shall conform to ACI 318, Building Code Requirements for Reinforced Concrete.
- B. Tests for slump shall be made when directed by the Engineer in accordance with ASTM C143.
- C. Air content tests shall be made, when directed by the Engineer, in accordance with ASTM C138, C173, C231, or AASHTO T-152.

PART 2 PRODUCTS

2.01 Formwork

- A. Formwork lumber shall be straight and clean. All nails shall be withdrawn and surfaces in contact with concrete shall be thoroughly cleaned before reuse.

2.02 Reinforcement

- A. Reinforcement bars shall be ASTM A615, Grade 60 deformed bars, except as otherwise indicated.
- B. Welded wire fabric shall conform to ASTM A185. Where welded wire fabric is shown but not sized on Drawings, use 6" x 6" x W2.9 x W2.9 WWF.
- C. Accessories for proper installation of reinforcement shall conform to CRSI "Manual of Standard Practice for Reinforced Concrete Construction". Bar supports at exposed surfaces shall be Class C-Plastic Protected.

- D. Reinforcement fabrication shall conform to ACI 315 and ACI 318, and approved shop drawings.
- E. Where the Drawings require Fibermesh concrete, the reinforcement shall be polypropylene fibers engineered and designed for secondary reinforcement of concrete slabs, complying with ASTM C 1116 Type III, as manufactured by Fibermesh Co., or approved equal.

2.03 Joint Fillers

- A. Joint fillers shall be products of the following manufacturers, or equal:
 - 1. W. R. Meadows, Inc., Elgin, Illinois
 - 2. W. R. Grace and Co., Cambridge, Massachusetts.
- B. Preformed bituminous fiber joint filler shall be non-extruding type conforming to ASTM D1751.
- C. Control joint strips shall have a minimum depth of 25 percent of slab thickness and a minimum thickness of 1/8 inch.

2.04 Concrete Materials

- A. Water shall be clean and potable
- B. Portland cement shall be ASTM C150 Type I, II or III.
- C. Fine and coarse aggregate shall be clean, hard, natural, or manufactured material conforming to ASTM C33.
- D. The nominal maximum size of the aggregate shall not be larger than three-fourths of the minimum clear spacing between individual reinforcing bars. Coordinate with maximum aggregate sizes specified hereafter for classes of concrete.
- E. Admixtures shall conform to ASTM C260 (air entrainment) or C494 (water reduction) and shall be products of one of the following manufacturers, or equal.
 - 1. Dewey and Almy Chemical Div., W. R. Grace and Co.
 - 2. Euclid Chemical Co.
 - 3. Master Builders Co.
 - 4. Sika Chemical Corp.

2.05 Miscellaneous Materials

- A. Vapor barrier shall be polyethylene film 0.006 inches thick and shall conform to Product Standard PS-17.

- B. Liquid membrane curing compound shall conform to ASTM C309, Type 1 or Type 2. Type 2 compound shall be used for P.C.C. pavement only. All permanently exposed exterior slabs shall receive clear acrylic curing and sealing compound. Moisture loss shall not be more than 0.055 gr./sq. cm when applied to 200 sq. ft./gal.
- C. Liquid membrane curing compound shall be products of one of the following manufacturers, or equal:
 - 1. W.R. Meadows "Curettard"
 - 2. Sonneborn-Contech "Sonsil"
 - 3. Burke Co. "Res-Xnu"
 - 4. Lambert Corp. "Gardseal"
- D. Chemical hardener shall be colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, conforming to Federal Specifications TT-C-800A and Corps of Engineers Specification CE 204.
- E. Chemical hardener shall be products of one of the following manufacturers, or equal:
 - 1. Euclid Chemical Co. "Surfhard"
 - 2. Sonneborn-Contech "Lapidolith"
 - 3. Master Builders "Saniseal"
 - 4. Lambert Corp. "Solidus"

2.06 Concrete Mixtures

- A. Concrete not indicated otherwise shall be Class A concrete.
- B. The proportions of cement, aggregate, and water shall be selected by the Contractor in accordance with ACI 318 to provide a plastic and workable mix. Coarse aggregate shall be limited to prevent harshness and honeycombing. Coarse aggregate size shall not be greater than the maximum listed for the various classes of concrete and as previously specified under aggregate.
- C. Class A structural concrete shall have a 28 day strength of 4000 psi, shall contain not less than 540 pounds (5-3/4 bags) of cement per cubic yard of concrete, shall have a water-cement ratio of not more than 0.47 (5-1/4 gallons per bag of cement), and shall contain 4 percent to 6 percent entrained air, by volume, except interior slabs subject to abrasion shall not contain more than 3 percent entrained air. In addition, Class A concrete shall contain a water-reducing, densifying admixture and have a maximum slump of 4 inches. The maximum aggregate size for slabs shall be 1 inch.

- D. Class B lean concrete shall have a 28 day strength of 3000 psi, it shall contain not less than 420 pounds (4-1/2 bags) of cement per cubic yard of concrete, shall have a water-cement ratio of not more than 0.71 (8 gallons per bag of cement), and shall have a 5 inch maximum slump. The maximum aggregate size shall be 2 inches.
- E. Water-reducing densifying admixture added to Class A concrete shall reduce the water-cement ratio while maintaining slump and compressive strength. Use as manufacturer recommends.
- F. Other admixtures may be proposed by the Contractor or requested by the Engineer and shall be provided at no additional cost to the Owner. Subject to approval, admixtures may be used for the following:
 - 1. To increase slump up to 50 percent while maintaining compressive strength and water-cement ratio.
 - 2. To retard set during hot weather
- G. Calcium chloride, admixtures containing calcium chloride, or admixtures not approved, in writing by the Engineer, are prohibited.

PART 3 EXECUTION

3.01 General

- A. Comply with ACI 305 or 306 for hot or cold weather concreting.
- B. Do not mix salt, chemicals, or other foreign materials with the concrete to prevent freezing without approval of the Engineer. Maintain the temperature of concrete above 50 degrees F for 5 days after placement. When high early strength Portland cement concrete is used, the temperature shall not be less than 70 degrees F for 2 days or 50 degrees F for 3 days.
- C. In no case shall the temperature of concrete exceed 90 degrees F at the time of placement.

3.02 Preparation

- A. Remove existing concrete and provide openings for installation of new work as indicated on Drawings. Repair all damage to existing work caused by concrete removal.
- B. Coordinate with other trades and properly place and locate in position all necessary dowels, bolts, anchors, anchor slots, inserts, sleeves, openings, hangers, metal ties and other fastening devices required for attachment and support of adjacent work. Securely anchor all embedded items.

- C. The subgrade and/or bedding shall be compacted and free of frost. If placement is allowed at temperatures below freezing, provide temporary heat and protection as required to remove all frost. Saturate the subgrade approximately 8 hours before placement and sprinkle ahead of the placement of concrete in areas where vapor barrier is not used. Remove all standing water, ice, mud, and foreign matter before concrete is deposited.
- D. On porous subgrade or beddings, or where indicated on the Drawings, provide vapor barrier. Lay vapor barrier sheets with 6 inch edge laps and tape or seal with mastic. Stretch and weight edges and laps to maintain their positions until concrete is placed. Coordinate with placement of reinforcement.

3.03 Formwork Requirements

- A. Formwork shall comply with ACI 347 and to shape, lines and dimensions as indicated on the Drawings. Forms shall be properly braced or tied to maintain position and shape under all dead and live loads and to prevent leakage. Forms shall be assembled so their removal will not damage the concrete. Tolerances for formed surfaces shall be in compliance with ACI 301.
- B. Lumber formwork may be used for surfaces which will not be exposed to view. Use plywood or metal forms for exposed surfaces.
- C. The inside surface of lumber forms shall be soaked with clean water prior to placing concrete. All other forms shall be treated with an approved form oil or lacquer. If oil is used, all excess oil shall be wiped off.

3.04 Reinforcement

- A. The placement of reinforcing steel shall conform to "Placing Reinforcing Bars", as published by the Concrete Reinforcing Steel Institute except as noted.
- B. Provide continuous reinforcement or dowels through construction joints. One half of reinforcement shall be discontinued across control joints unless otherwise indicated. All reinforcement shall be discontinued across expansion joints.
- C. Splice laps shall be as indicated on the Drawings.
- D. Fabric reinforcement for slabs shall be overlapped at splices not less than the spacing of the cross wires plus 2 inches. Fabric shall extend to within 4 inches of concrete edges.
- E. Unless otherwise shown, place reinforcement 2 to 3 inches below the top of the finished slab. Mesh shall either be sandwiched between two layers of fresh concrete or supported on mesh supports. Supports that may puncture the vapor barrier, if any, shall not be used.
- F. Where reinforcing is fibermesh, incorporate polypropylene fibers fully into the concrete prior to placement.

3.05 Joints

- A. Provide construction joints with shear transfer keyways as indicated.
- B. Tops of edge forms and screeds shall be set to the finished elevations and to provide uniform pitch to drains as indicated on Drawings.
- C. For drives, pavements, parking areas, walks and slabs on grade, provide preformed non-extruding asphalt strip or bituminous fiber joint filler set 1/8 inch below finished surface unless otherwise indicated. Tool concrete edges on each side of joint. No sealant is required.

3.06 Batching

- A. Materials for concrete shall be proportioned and batched according to the approved design mix.
- B. Water shall be measured to within 1 pint of the total amount required per batch. Admixtures shall be measured by weight or volume to an accuracy of 3 percent.

3.07 Mixing and Transporting Concrete

- A. Concrete shall be ready-mixed or job-mixed at the Contractor's option. Ready-mixed concrete shall be mixed and delivered to the project in accordance with ASTM C94. Job-mixed concrete shall be in accordance with the requirements of ACI 318.
- B. Concrete shall be in its final position within one hour after the water and aggregate have been added to the cement, except in cool weather (50 degrees F or less).
- C. Concrete shall be transported from the mixer to place of final deposit in such manner to prevent separation or loss of ingredients.

3.08 General Concrete Placement Schedule

- A. All structural concrete shall be Class A Concrete.
- B. Sidewalks, curbing, and driveways shall be Class B Concrete.

3.09 Depositing Concrete

- A. Concrete shall be placed in accordance with the requirements of ACI 318 and within 10 feet of its final position. Place concrete only during normal working hours unless the Engineer is notified at least 24 hours in advance. Concrete shall not be placed until the Engineer has approved the formwork, reinforcement, and embedded items and debris has been removed.
- B. Whenever new concrete is to be placed against existing surfaces, roughen and clean the surface to improve bond.

- C. Provide runways and chutes to discharge concrete close to final position to minimize spreading and segregation.
- D. Place slabs-on-grade using formed construction joints. Maximum size of pour shall be 40 feet each way for slabs with wire mesh reinforcement and 75 feet each way for slabs with bar reinforcement. Allow 24 hours between pours of adjacent slabs. Provide joints as specified or shown. Set continuous joint strips between slabs and abutting vertical surfaces as indicated on the Drawings.

3.10 Finishing Slabs and Flatwork

- A. Unless otherwise indicated, provide the following slab finishes:

Description	Concrete Finish
Class B concrete surfaces	Float
Submerged slabs	1 Troweling
Exposed slabs	3 Trowelings
Ramps and walks	Float and broom finish

- B. Concrete shall be within ¼ inch of a 10 foot straightedge in all directions except where slabs are dished for drains. Deviations from the elevation indicated shall not exceed ¼ inch.
- C. Slabs sloped for drainage shall not have depressions that retain water.
- D. Immediately after placement, screed concrete with straightedges or power strikeoffs. Do not use roller screeds or vibrating screeds.
- E. Stakes for wet screeds shall be driven down flush with subgrade or pulled out as work progresses to avoid disturbing screeded concrete.
- F. For drains in level slabs, form a 5 foot diameter depression approximately ½ inch below the adjacent slab surface.
- G. Unless otherwise indicated on the Drawings, slabs sloped for drainage shall be uniformly pitched toward the drains at 1/8 inch per foot. Form a dished depression at drains unless otherwise indicated.
- H. Immediately after screeding, darby surface with wood or magnesium darby to eliminate ridges and to fill in voids left by screeding.

3.11 Float Finish

- A. Float concrete using magnesium or aluminum hand floats or power floats after the concrete has stiffened to a point where only a ¼ inch indentation can be imparted by normal foot pressure.
- B. Float finish shall result in a uniform, smooth, granular texture. After floating, check slab tolerances with 10-foot straightedge. Fill low spots with fresh concrete; do not sprinkle with dry cement.

3.12 Trowel Finish

- A. Where scheduled, or indicated, trowel with steel trowels after floating.
- B. Initial troweling shall be done either by power or by hand with the trowel blade kept as flat as possible against concrete surface to prevent washboard or chatter effect.
- C. Second troweling may be done by power if three trowelings are scheduled. If two trowelings are specified, second troweling shall be done by hand.
- D. Third troweling shall be done by hand and shall continue until the concrete is consolidated to a uniform, smooth, dense surface free of trowel marks and irregularities.
- E. Allow sufficient time between successive trowelings to allow the concrete to become harder. Each successive troweling shall be done with trowels that are progressively smaller and are tipped more to increase compaction of the concrete surface.

3.13 Brooming

- A. Broom at right angles to direction of traffic to give a non-skid finish. Use a fine, soft-bristled broom for pedestrian ramps and walks, and a coarse, hard-bristled broom for vehicular pavement.

3.14 Control Joints

- A. Control joints for non-structural slabs shall consist of partial depth plastic strips set flush with finished surface or 1/8 inch wide joints cut with a diamond saw. Control joints shall be one-quarter to one-third the depth of the slab unless otherwise indicated.
- B. Saw joints as soon as concrete has hardened sufficiently so aggregate will not be dislodged but before shrinkage stresses develop cracks. Sawn joints shall be filled with approved joint sealant.
- C. Unless otherwise indicated on the Drawings, spacing of control joints shall not exceed 25 feet in each direction.

3.15 Protection and Curing

- A. Comply with ACI 305 and 306 for protecting and curing concrete in hot and cold weather. Fresh concrete shall be protected from rain, premature drying and excessively hot or cold temperatures, and shall be maintained with minimal moisture loss for the period of time necessary for the hydration of the cement and proper hardening of the concrete. Cure all concrete for a minimum period of 7 days (3 days for high early strength concrete) after placing.

- B. Immediately after finishing, begin curing by covering with constantly saturated moisture retaining fabrics, impervious sheeting, or membrane curing compounds. Surfaces shall be thoroughly wetted with a fine spray before they are covered with sheeting.
- C. Sheeting shall provide complete surface coverage with all joints lapped at least 4 inches and shall be placed and secured in a manner that will not mar or damage the concrete surface.
- D. Apply membrane-curing compound in accordance with manufacturer's recommendations. Apply by spraying in a two coat continuous operation. Apply the coats at right angles to each other with a coverage of 200 square feet per gallon per coat. Begin application not later than 4 hours after finishing of the surface. The application shall result in an uninterrupted adherent film free of defects.
- E. On surfaces scheduled to receive sealants, paint, seamless flooring, or other adhesive bonded finishes, either the membrane curing compound shall be compatible with the bonding agent or the curing compound shall be removed with sandblasting, acid etching or grinding, to the satisfaction of the installer of the finish surfacing. Bonded surfaces that fail to adhere to the concrete shall be removed and replaced at no additional cost to the Owner.
- F. Apply hardener to floors of mechanical and electrical rooms and in other areas as required. Application shall be in strict accordance with the manufacturer's recommendations and as follows:
 - 1. Hardener shall be applied at original container consistency without dilution to dry, clean surfaces no sooner than 30 days following completion of curing. NOTE: Hardener shall not be applied over surfaces covered with membrane curing agent.
 - 2. Application shall generally be a three-coat process adjusted to accommodate extreme concrete densities only if prior review has been obtained from the Engineer. Application coverage shall be made at the approximate rate of one gallon to 100 square feet.
 - 3. Apply first and second coats generously to surface, mop or squeegee standing water to leave a uniformly wet surface, allow to dry. Apply third coat in a manner similar to first two, except that surplus must be scrubbed with stiff bristled broom and flushed from floor surface with clear water. Scrubbing and flushing shall remove all traces of effervescence. Remove excess water and allow to dry.

3.16 Defective Concrete

- A. All concrete not formed as indicated on the Drawings within tolerances specified in ACI 347 shall be removed and replaced.
- B. Temperature and shrinkage cracks which develop prior to final acceptance of the work shall be repaired.

3.17 Miscellaneous Concrete Work

- A. Provide concrete equipment pads and supports as indicated and conforming to approved shop drawings. Fastening devices and accessories shall be located by templates or setting diagrams furnished by the manufacturer.

3.18 Clean-Up

- A. All concrete floor construction shall have the surfaces thoroughly scrubbed and cleaned with clear water. After cleaning, the floors shall be protected until they are accepted.
- B. Clean all surfaces affected by the Concrete Work. No extraneous concrete or discoloration shall be left on any construction.

3.19 Concrete Testing

- A. Compressive Strength Tests: Conform to ASTM C31 and ASTM C39. One set of four cylinders for each 50 cubic yards or fraction thereof, of each strength concrete placed in any one day. Test one specimens at seven days; test two specimens at 28 days. One specimen shall be retained for 56 days and tested only at the direction of the Engineer.
- B. Slump Tests: Conform to ASTM C143. Perform one test for each load point of discharge and one for each set of compressive strength test specimens.

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SECTION 04220
CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Mortar and grout.
 - 3. Steel reinforcing bars.
 - 4. Masonry-joint reinforcement.
 - 5. Embedded flashing.
 - 6. Miscellaneous masonry accessories.
 - 7. Masonry-cell fill.

1.2 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
 - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material Certificates: For each type and size of the following:

1. Masonry units.
 - a. Include data on material properties.
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 2. Cementitious materials. Include name of manufacturer, brand name, and type.
 3. Mortar admixtures.
 4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 5. Grout mixes. Include description of type and proportions of ingredients.
 6. Reinforcing bars.
 7. Joint reinforcement.
- C. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.
1. Include test reports for mortar mixes required to comply with property specification. Test in accordance with ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
 2. Include test reports, in accordance with ASTM C1019, for grout mixes required to comply with compressive strength requirement.
- D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined in accordance with TMS 602/ACI 530.1/ASCE 6.
- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified in accordance with ASTM C1093 for testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 3. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
 - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with TMS 602/ACI 530.1/ASCE 6.
 - 2. Determine net-area compressive strength of masonry by testing masonry prisms in accordance with ASTM C1314.

2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, units are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - 2. Provide square-edged units for outside corners unless otherwise indicated.

- B. Insulated CMUs: Where indicated, units contain rigid, specially shaped, molded-polystyrene insulation units complying with ASTM C578, Type I, designed for installing in cores of masonry units.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Concrete Block Insulating Systems
 - b. Shelter Enterprises Inc.
- C. CMUs: ASTM C90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi
 - 2. Density Classification: Normal weight unless otherwise indicated.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
 - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
 - 5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

2.5 MASONRY LINTELS

- A. General: Provide one of the following:
- B. Concrete Lintels Matching CMU in Color, Texture: ASTM C1623, matching density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.
- C. Precast or Formed-in-Place Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Structural Drawings and with reinforcing bars indicated.
- D. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content is not more than 0.1 percent when tested in accordance with ASTM C114.

- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lafarge North America Inc.
 - b. Lehigh Hanson; Heidelberg Cement Group
- E. Aggregate for Mortar: ASTM C144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- F. Aggregate for Grout: ASTM C404.
- G. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - b. GCP Applied Technologies Inc.
- H. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ACM Chemistries
 - b. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - c. GCP Applied Technologies Inc.
 - d. Master Builders Solutions; brand of MBCC Group
- I. Water: Potable.

2.7 TIES AND ANCHORS

- A. General: Ties and anchors extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
 - 2. Steel Plates, Shapes, and Bars: ASTM A36/A36M

2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

2.9 MASONRY-CELL FILL

- A. Loose-Fill Insulation: Perlite complying with ASTM C549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).
- B. Lightweight-Aggregate Fill: ASTM C331/C331M.

2.10 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. See structural drawings for requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
 4. Verify that substrates are free of substances that would impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.

5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

- H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 - 2. Bed webs in mortar in grouted masonry, including starting course on footings.
 - 3. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.
- E. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 MASONRY-CELL FILL INSTALLATION

- A. Pour loose-fill insulation into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 feet.
- B. Install molded-polystyrene insulation units into masonry unit cells before laying units.

3.7 CONTROL JOINTS

- A. General: Install control-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
 - 2. Install preformed control-joint gaskets designed to fit standard sash block.
 - 3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.

3.8 LINTELS

- A. Provide masonry lintels where shown and where openings of more than 24 inches for block-size units are shown without structural steel or other supporting lintels.
- B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.9 FLASHING

- A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing.
 - 2. At lintels, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
 - 3. Install metal drip edges with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install nailers for flashing and other related construction where they are shown to be built into masonry.

3.10 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 48 inches.

3.11 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements is done at Contractor's expense.
- B. Inspections: Special inspections in accordance with Structural drawing information.
 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 3. Place grout only after inspectors have verified proportions of site-prepared grout.

3.12 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.13 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION

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SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Wood products.
 2. Wood-preservative-treated lumber.
 3. Dimension lumber framing.

1.2 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Lumber grading agencies, and abbreviations used to reference them, include the following:
1. NLGA: National Lumber Grades Authority.
 2. SPIB: The Southern Pine Inspection Bureau.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

- A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.

B. Maximum Moisture Content:

1. Boards: 15 percent.
2. Dimension Lumber: 15 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWP A U1, Use categories as follows:

1. UC3A (All Other Commodity Specifications): Coated products excluding sawn products in exterior construction not in contact with ground, exposed to all weather cycles but protected from liquid water. Include all rough carpentry.
 - a. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
3. After treatment, redry dimension lumber to 19 percent maximum moisture content.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry unless otherwise indicated.

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.3 FASTENERS

A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329.

B. Nails, Brads, and Staples: ASTM F1667.

- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Do not splice structural members between supports unless otherwise indicated.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- E. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- F. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.

- H. Securely attach roofing nailers to substrates by anchoring and fastening to withstand bending, shear, or other stresses imparted by Project wind loads and fastener-resistance loads as designed in accordance with ASCE/SEI 7.
- I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 07210
THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket insulation.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes less than Class A, 25 and 450 when tested in accordance with ASTM E84.
- B. Fire-Resistance Ratings: Comply with ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.
- C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- D. Thermal-Resistance Value (R-Value): R-value as indicated on Drawings in accordance with ASTM C518.

1. R-Value at Operation Building in Attic Space: R-38.

2.2 GLASS-FIBER BLANKET INSULATION

- A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed; SAINT-GOBAIN
 - b. Johns Manville; a Berkshire Hathaway company
 - c. Knauf Insulation
 - d. Owens Corning

2.3 INSULATION FASTENERS

- A. Insulation Fastener Accessories: Provide double-pointed weld pins, lagging pins, quilting pins, duct liner pins, insulation hangers, specialty washers, special caps, j-hooks, capacitor discharge annular weld pins, capacitor discharge acoustical lagging pins, and other accessory materials that are recommended in writing by insulation fastener manufacturer to produce complete insulation supports.

2.4 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or those that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products, applications and applicable codes.

- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
- F. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..
- G. Loose-Fill Insulation: Apply in accordance with ASTM C1015 and manufacturer's written instructions.
 - 1. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.
 - 2. For cellulosic-fiber loose-fill insulation, comply with CIMA's Technical Bulletin #2, "Standard Practice for Installing Cellulose Building Insulation."

3.3 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

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SECTION 07542

THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Thermoplastic polyolefin (TPO) roofing system.
2. Accessory roofing materials.
3. Roof insulation.
4. Insulation accessories and cover board.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
2. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counter flashings.
3. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.

5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data:
 1. Thermoplastic polyolefin (TPO) roofing system.
 2. Accessory roofing materials.
 3. Roof insulation.
 4. Insulation accessories and cover board.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 1. Layout and thickness of insulation.
 2. Base flashings and membrane termination details.
 3. Flashing details at penetrations.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 1. Roof membrane and flashings, of color required.
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, and, testing agency.
- B. Manufacturer Certificates:
 1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of compliance with performance requirements.
 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

- C. Product Test Reports: For roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.
- D. Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Field Test Reports:
 - 1. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.
- F. Field quality-control reports.
- G. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of structure.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes roof membrane, base flashings, roof insulation,, fasteners,, cover boards,, vapor retarder, and other components of roofing system.
 - 2. Warranty Period: 20 years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, roof insulation,, fasteners,, cover boards, vapor retarders for the following warranty period:
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings to remain watertight.
 - 1. Accelerated Weathering: Roof to withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:
- D. See Structural drawings for roof pressure information.

- E. SPRI's Directory of Roof Assemblies Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and are listed in SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this Project.

- 1. Wind Uplift Load Capacity: See structural drawings

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING SYSTEM

- A. TPO Sheet: ASTM D6878/D6878M, internally fabric- or scrim-reinforced, self-adhering TPO sheet.

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle Syntec Systems
 - b. GAF
 - c. Johns Manville; a Berkshire Hathaway company
 - d. Versico Roofing Systems; Carlisle Construction Materials
 - 2. Source Limitations: Obtain components for roofing system from roof membrane manufacturer, or, manufacturers approved by roof membrane manufacturer.
 - 3. Thickness: 60 mils, nominal.
 - 4. Exposed Face Color: White.

2.3 ACCESSORY ROOFING MATERIALS

- A. General: Accessory materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
 - 2. Adhesives and sealants shall comply with the following limits for VOC content:
 - a. Gypsum Board and Panel Adhesives: 50 g/L.
 - b. Multipurpose Construction Adhesives: 70 g/L.
 - c. Fiberglass Adhesives: 80 g/L.
 - d. Contact Adhesives: 80 g/L.
 - e. PVC Welding Compounds: 510 g/L.
 - f. Other Adhesives: 250 g/L.
 - g. Single-Ply Roof Membrane Sealants: 450 g/L.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils thick, minimum, of same color as TPO sheet.
- C. Bonding Adhesive: Manufacturer's standard.

- D. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.
- E. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, and other accessories.

2.4 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by TPO roof membrane manufacturer.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
 - 1. Compressive Strength: 20 psi.
 - 2. Size: 48 by 48 inches.
 - 3. Thickness:
 - a. Base Layer: 2 ½ inches.
 - b. Upper Layer: 2 inches

2.5 INSULATION ACCESSORIES AND COVER BOARD

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners with metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Full-spread, spray-applied, low-rise, two-component urethane adhesive.
- D. Glass-Mat Gypsum Cover Board: ASTM C1177/C1177M, water-resistant gypsum board.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed; SAINT-GOBAIN
 - b. Georgia-Pacific Gypsum LLC
 - c. Gold Bond Building Products, LLC provided by National Gypsum Company
 - d. USG Corporation

2. Thickness: 1/2 inch.
3. Surface Finish: Fiberglass facer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 1. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 2. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 3. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than **75** percent, or as recommended by roofing system manufacturer, when tested according to ASTM F2170.
 - a. Test Frequency: One test probe per each 500 sq. ft., or portion thereof, of roof deck, with not less than three tests probes.
 - b. Submit test reports within 24 hours after performing tests.
 4. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
 5. Verify that joints in precast concrete roof decks have been grouted flush with top of concrete.
 6. Verify that minimum curing period recommended by roofing system manufacturer for lightweight insulating concrete roof decks has passed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Perform fastener-pullout tests according to roof system manufacturer's written instructions.
 1. Submit test result within 24 hours after performing tests.

- a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions, SPRI's Directory of Roof Assemblies listed roof assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning Work on adjoining roofing.
- C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

3.4 INSTALLATION OF INSULATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Installation Over Concrete Decks:
 - 1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.
 - a. Where installing composite and non-composite insulation in two or more layers, install non-composite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - d. Fill gaps exceeding 1/4 inch with insulation.
 - e. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - f. Loosely lay base layer of insulation units over substrate.
 - g. Adhere base layer of insulation to concrete roof deck according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

- 1) Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft., and allow primer to dry.
 - 2) Set insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.
 - 3) Set insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - 4) Set insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
2. Install upper layers of insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
- a. Staggered end joints within each layer not less than 24 inches in adjacent rows.
 - b. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
 - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - e. Fill gaps exceeding 1/4 inch with insulation.
 - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - g. Loosely lay each layer of insulation units over substrate.
 - h. Adhere each layer of insulation to substrate using adhesive according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.
 - 2) Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - 3) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.

3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Loosely lay cover board over substrate.
5. Adhere cover board to substrate using adhesive according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - a. Set cover board in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.
 - b. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - c. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- B. Install slip sheet over cover board and beneath roof membrane.
- C. Place plates on insulation in required fastening patterns and secure in accordance with manufacturer's instructions.
 1. Install plates and fasteners tight and flat to substrate with no dimpling, and with fastener extending 1 inch minimum into roof deck; do not overdrive fasteners.

3.6 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- F. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing.
- G. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- H. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane and sheet flashings, to ensure a watertight seam installation.
 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.

2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- I. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.7 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and to inspect substrate conditions, surface preparation, roof membrane application, sheet flashings, protection, and drainage components, and to furnish reports to Architect.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.10 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - 1. Owner: City of Ocoee, Florida.
 - 2. Owner Address: 1800 A.D. Mims Road, Ocoee, FL.
 - 3. Building Name/Type: Ocoee WWTP Electric Building.
 - 4. Area of Work: New TPO Roof.
 - 5. Acceptance Date: _____.
 - 6. Warranty Period: 20 years.
 - 7. Expiration Date: _____.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding _____ mph.
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

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SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Custom flashing and trim fabrications, made from the following:
 - 1. Sheet metal materials.
 - 2. Underlayment.
 - 3. Miscellaneous materials.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
 - 3. Review requirements for insurance and certificates if applicable.
 - 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For sheet metal flashing and trim.
 - 1. Plans, elevations, sections, and attachment details.
 - 2. Identification of material, thickness, weight, and finish for each item and location in Project.
 - 3. Details for forming, including profiles, shapes, seams, and dimensions.
 - 4. Details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 5. Details of termination points and assemblies.
 - 6. Details of connections to adjoining work.

7. Formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Entity that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. For roof edge flashings and copings that are ANSI/SPRI/FM 4435/ES-1 tested, shop is to be listed as able to fabricate required details as tested and approved.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.7 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing", and, SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install roof edge flashings and copings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:
 1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METAL MATERIALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: Coil-coated sheet, ASTM B209/B209M, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 1. Thickness: 0.032 inch.
 2. Surface: Smooth, flat.
 3. Exposed Coil-Coated Finish:
 4. Color: As selected by Architect from manufacturer's full range.

5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 UNDERLAYMENT

- A. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F; and complying with physical requirements of ASTM D226/D226M for Type I and Type II felts.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Atlas Molded Products, a division of Atlas Roofing Corporation
 - b. Intertape Polymer Group
 - c. Kirsch Building Products
 - d. SDP Advanced Polymer Products Inc.

2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C920, elastomeric polyurethane or polysulfide polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- H. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
 - 1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 ft. on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
 - 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, non-expansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams:
 - 1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
 - 3. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- H. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters:
 - 1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
 - 2. Fabricate in minimum 96-inch- long sections.
 - 3. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than dimension indicated on Drawings.
 - 4. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
 - 5. Gutter Profile: Style A in accordance with cited sheet metal standard.
 - 6. Expansion Joints: Butt type with cover plate.
 - 7. Accessories: Wire-ball downspout strainer
 - 8. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:
 - a. Aluminum: 0.032 inch thick.

- B. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
 - 1. Fabricated Hanger Style: Fig. 1-35A in accordance with SMACNA's "Architectural Sheet Metal Manual."
 - 2. Fabricate from the following materials:
 - a. Aluminum: 0.032 inch thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 12 ft. long sections. Furnish with 6-inch- wide, joint cover plates.
 - 1. Joint Style: Overlapped, 4 inches wide.
 - 2. Fabricate from the following materials:
 - a. Aluminum: 0.050 inch thick.
- B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12 ft.- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, weld watertight. Shop fabricate interior and exterior corners.
 - 1. Coping Profile: Fig. 3-4A in accordance with SMACNA's "Architectural Sheet Metal Manual."
 - 2. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate.
 - 3. Fabricate from the following materials:
 - a. Aluminum: 0.050 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrates, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over substrate to prevent air infiltration or water penetration.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, in accordance with manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
 - 1. Lap horizontal joints not less than 4 inches.
 - 2. Lap end joints not less than 12 inches.

3.3 INSTALLATION OF SHEET METAL FLASHING AND TRIM, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of welds and sealant.
 - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 - 5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 - 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
 - 8. Do not field cut sheet metal flashing and trim by torch.
 - 9. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
 - 1. Space movement joints at maximum of 10 ft. with no joints within 24 inches of corner or intersection.
 - 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
 1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
 - b. Form joints to completely conceal sealant.
 - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.4 INSTALLATION OF ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters:
 1. Join sections with rivetted and soldered joints.
 2. Provide for thermal expansion.
 3. Attach gutters at eave to firmly anchor them in position.
 4. Provide end closures and seal watertight with sealant.
 5. Slope to downspouts.
 6. Fasten gutter spacers to front and back of gutter.
 7. Anchor and loosely lock back edge of gutter to continuous cleat, eave or apron flashing.
 8. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
 9. Anchor gutter with gutter brackets spaced not more than 24 inches apart to roof deck unless otherwise indicated, and loosely lock to front gutter bead.
- C. Downspouts:
 1. Join sections with 1-1/2-inch telescoping joints.
 2. Provide hangers with fasteners designed to hold downspouts securely to walls.

3. Locate hangers at top and bottom and at approximately 60 inches o.c.
4. Provide elbows at base of downspout to direct water away from building.

3.5 INSTALLATION TOLERANCES

- A. Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 ft. on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING

- A. Clean off excess sealants.

3.7 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION

SECTION 08111

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior standard steel doors and frames.
- B. Related Requirements:
 - 1.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Exterior standard steel doors and frames.
- B. Product Data Submittals: For each product.

1. Include construction details, material descriptions, core descriptions, and finishes.
- C. Shop Drawings: Include the following:
1. Elevations of each door type.
 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of each different wall opening condition.
 6. Details of anchorages, joints, field splices, and connections.
 7. Details of accessories.
- D. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For door inspector.
1. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
- B. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.8 QUALITY ASSURANCE

- A. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies is to meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ceco Door; AADG, Inc.; ASSA ABLOY
 - 2. Curries, AADG, Inc.; ASSA ABLOY Group
 - 3. Steelcraft; Allegion plc

2.2 PERFORMANCE REQUIREMENTS

- A. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone [1] [2] [3] [4] for [basic] [enhanced] protection.
 - 1. Large-Missile Test: For glazed openings located within [30 feet] <Insert dimension> of grade.
- B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.50 deg Btu/F x h x sq. ft. when tested in accordance with ASTM C1363 or ASTM E1423.

2.3 EXTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B.
 - 1. Doors:
 - a. Type: As indicated in the Door and Frame Schedule on Drawings.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch, with minimum A60 coating.

- d. Edge Construction: Model 1, Full Flush.
 - e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
 - f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
 - g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
 - h. Core: Manufacturer's standard.
- 2. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
 - b. Construction: Full profile welded.
- 3. Exposed Finish: Prime.

2.4 HOLLOW-METAL PANELS

- A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
 - 3. Post-installed Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.6 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

- B. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.
- C. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- D. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

2.7 FABRICATION

- A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.
 - 1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
 - 2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer

for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
 - a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
 - b. Install frames with removable stops located on secure side of opening.
 - 2. Floor Anchors: Secure with post-installed expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Solidly pack mineral-fiber insulation inside frames.
 - 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
 - 5. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

- c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
 - 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.

3.3 FIELD QUALITY CONTROL

- A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.
- B. Inspections:
 - 1. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

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SECTION 08710

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hinges.
2. Mortise locks.
3. Surface bolts.
4. Exit devices and auxiliary items.
5. Lock cylinders.
6. Coordinators.
7. Carry-open bars.
8. Astragals.
9. Surface closers.
10. Door gasketing.
11. Thresholds.
12. Metal protective trim units.

1.2 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
1. Conference participants must include Installer's Architectural Hardware Consultant and Owner's security consultant.
- B. Keying Conference: Conduct conference at Project site.
1. Conference participants must include Installer's Architectural Hardware Consultant and Owner's security consultant.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Hinges.
2. Mortise locks.
3. Manual flush bolts.
4. Exit devices and auxiliary items.
5. Astragals.
6. Surface closers.
7. Door gasketing.
8. Thresholds.
9. Metal protective trim units.
10. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Product Data Submittals: For each product.

C. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Submittal Sequence: Submit door hardware schedule concurrent with submissions of product data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
2. Format: Use same scheduling sequence and format and use same door numbers as in door hardware schedule in the Contract Documents.
3. Content: Include the following information:
 - a. Identification number, location, hand, fire rating, size, and material of each door and frame.
 - b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
 - d. Fastenings and other installation information.
 - e. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
 - f. Mounting locations for door hardware.
 - g. List of related door devices specified in other Sections for each door and frame.

D. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals.
- B. Schedules: Final door hardware, keying schedule.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.
 - 1. Scheduling Responsibility: Preparation of door hardware and keying schedule.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lockup for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to Owner by registered mail or overnight package service.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including excessive deflection, cracking, or breakage.
 - b. Faulty operation of doors and door hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:

- a. Exit Devices: Two years from date of Substantial Completion.
- b. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of door hardware from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with Florida Building Code Accessibility Code, most current edition.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
 - 2. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
 - 3. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.

2.3 HINGES

- A. Hinges: ANSI/BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Baldwin; part of the Spectrum Brands Hardware and Home Improvement Group (HHI)
 - b. Lawrence Hardware Inc.
 - c. McKinney Products Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY
 - d. STANLEY; dormakaba USA, Inc.

2.4 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
- C. Lock Backset: 2-3/4 inches unless otherwise indicated.
- D. Lock Trim:
 1. Levers: Cast.
 2. Escutcheons (Roses): Cast.
 3. Dummy Trim: Match lever lock trim and escutcheons.
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
- F. Mortise Locks: ANSI/BHMA A156.13, Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc
 - b. Corbin Russwin, Inc.; an ASSA ABLOY Group company
 - c. dormakaba USA Inc.
 - d. SARGENT Manufacturing Company; ASSA ABLOY

2.5 SURFACE BOLTS

- A. Surface Bolts: ANSI/BHMA A156.16.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Don-Jo Mfg., Inc
 - b. Hiawatha, Inc; a division of the Activar Construction Products Group
 - c. Trimco

2.6 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: ANSI/BHMA A156.3.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. C.R. Laurence Co., Inc.; CRH Americas, Inc.
 - b. Corbin Russwin, Inc.; an ASSA ABLOY Group company
 - c. dormakaba USA Inc.
 - d. SARGENT Manufacturing Company; ASSA ABLOY
 - e. STANLEY; dormakaba USA, Inc.

2.7 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. Provide cylinder from same manufacturer of locking devices.
- B. Standard Lock Cylinders: ANSI/BHMA A156.5, Grade 1 permanent cores; face finished to match lockset.
 - 1. Core Type: Interchangeable
- C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
- D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.8 KEYING

- A. Keying System: Factory registered, complying with guidelines in ANSI/BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.
 - 1. Existing System:
 - a. Master key or grand master key locks to Owner's existing system.
 - b. Re-key Owner's existing master key system into new keying system.
 - 2. Keyed Alike: Key all cylinders to same change key.
- B. Keys: Nickel silver
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."

2.9 ACCESSORIES FOR PAIRS OF DOORS

- A. Astragals: ANSI/BHMA A156.22.

2.10 SURFACE CLOSERS

- A. Surface Closers: ANSI/BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Corbin Russwin, Inc.; an ASSA ABLOY Group company
 - b. dormakaba USA Inc.
 - c. Hager Companies
 - d. Rixson Specialty Door Controls; ASSA ABLOY
 - e. SARGENT Manufacturing Company; ASSA ABLOY
 - f. STANLEY; dormakaba USA, Inc.

2.11 DOOR GASKETING

- A. Door Gasketing: ANSI/BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. National Guard Products, Inc
 - b. Pemko Manufacturing Company Inc.; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY
- B. Maximum Air Leakage: When tested in accordance with ASTM E283/E283M with tested pressure differential of 0.3 inch wg, as follows:
 1. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
 2. Gasketing on Double Doors: 0.50 cfm per ft. of door opening.

2.12 THRESHOLDS

- A. Thresholds: ANSI/BHMA A156.21; fabricated to full width of opening indicated.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hager Companies
 - b. National Guard Products, Inc
 - c. Pemko Manufacturing Company Inc.; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY
 - d. Rixson Specialty Door Controls; ASSA ABLOY

2.13 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: ANSI/BHMA A156.6; fabricated from 0.050-inch- thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Don-Jo Mfg., Inc
- b. Hager Companies
- c. Rockwood Manufacturing Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY
- d. Trimco

2.14 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.
 - 1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and ANSI/BHMA A156.18.
- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended; however, aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
 - 3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.15 FINISHES

- A. Provide finishes complying with ANSI/BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames in accordance with ANSI/SDI A250.6.
- B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as directed by Owner.
 - 2. Furnish permanent cores to Owner for installation.

- E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."
- F. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 1. Do not notch perimeter gasketing to install other surface-applied hardware.
- G. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- H. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
 - 1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
 - 2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.
 - 3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
- B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant is to examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.

- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, maintenance service is to include 12 months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Parts and supplies are to be manufacturer's authorized replacement parts and supplies.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain door hardware.

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SECTION 09290

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Gypsum board, Type X.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated in accordance with ASTM E119 by an independent testing agency.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C1396/C1396M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum
 - b. CertainTeed; SAINT-GOBAIN
 - c. Georgia-Pacific Gypsum LLC
 - d. Gold Bond Building Products, LLC provided by National Gypsum Company
 - e. USG Corporation
 - 2. Thickness: 5/8 inch.
 - 3. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 - 2. Shapes:
 - a. U-Bead: J-shaped; exposed short flange does not receive joint compound.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.

- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

2.6 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- D. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- E. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."
- F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch wide joints to install sealant.
- F. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: As indicated on Drawings.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels [vertically (parallel to framing)] [horizontally (perpendicular to framing)] unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

- a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

3.4 FINISHING OF GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- C. Gypsum Board Finish Levels: Finish panels to levels indicated below and in accordance with ASTM C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
 - b. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.5 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

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SECTION 09651

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl base.
 - 2. Rubber molding accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- C. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.3 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 VINYL BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flexco Corporation
 - 2. Johnsonite; a Tarkett company
 - 3. Roppe Corporation; Roppe Holding Company
- B. Product Standard: ASTM F1861, Type TV (vinyl, thermoplastic).
 - 1. Group: I (solid, homogeneous).
 - 2. Style and Location:
 - a. Style B, Cove
- C. Minimum Thickness: 0.125 inch.
- D. Height: As indicated on Drawings
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed or preformed
- G. Inside Corners: Job formed or preformed.
- H. Colors and Patterns: Match Architect's sample.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.

- B. Apply resilient base to walls and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Miter or cope corners to minimize open joints.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09911

EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Primers.
 - 2. Finish coatings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product Schedule: Use same designations indicated on Drawings and in the Exterior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.4 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 PRIMERS

- A. Alkyd Metal Primer: Corrosion-resistant, solvent-based, alkyd primer formulated for use on prepared ferrous metals subject to industrial and light marine environments.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Benjamin Moore & Co.
 - b. PPG Paints; PPG Industries, Inc.
 - c. Sherwin-Williams Company (The)

2.2 FINISH COATINGS

- A. Exterior Alkyd Enamel, Semigloss: Solvent-based, pigmented, alkyd enamel formulated for mold, microbial, and water resistance and for use on exterior, primed, wood and metal surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Behr Paint Company; Behr Process Corporation
 - b. PPG Paints; PPG Industries, Inc.
 - c. Sherwin-Williams Company (The)
 - 2. Gloss Level: Manufacturer's standard semigloss finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.

- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
 - 1. SSPC-SP 3.
 - 2. SSPC-SP 7/NACE No. 4.
 - 3. SSPC-SP 11.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.

4. Paint entire exposed surface of window frames and sashes.
 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 6. Primers specified in the Exterior Painting Schedule may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
 - C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
 - D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written instructions, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written instructions.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 3. Allow empty paint cans to dry before disposal.
 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates:

1. Alkyd System:

- a. Prime Coat: Alkyd metal primer or Shop primer specified in Section in which substrate is specified
- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Exterior alkyd enamel, semigloss.

B. Galvanized-Metal Substrates:

1. Water-Based, Light Industrial Coating System:

- a. Prime Coat: Epoxy metal primer
- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

END OF SECTION

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SECTION 09912

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Primers.
 - 2. Water-based finish coatings.
 - 3. Solvent-based finish coatings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 PRIMERS

- A. Interior/Exterior Latex Block Filler: Water-based, high-solids, emulsion coating formulated to bridge and fill porous surfaces of exterior concrete masonry units in preparation for specified subsequent coatings.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Benjamin Moore & Co.
 - b. PPG Paints; PPG Industries, Inc.
 - c. Sherwin-Williams Company (The)
- B. Water-Based Galvanized-Metal Primer: Corrosion-resistant, acrylic primer; formulated for use on cleaned/etched, exterior, galvanized metal to prepare it for subsequent water-based coatings.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Benjamin Moore & Co.
 - b. PPG Paints; PPG Industries, Inc.
 - c. Sherwin-Williams Company (The)

2.2 WATER-BASED FINISH COATS

- A. Interior, Latex, Semigloss: Pigmented, water-based paint for use on primed wood and metals.
 1. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Benjamin Moore & Co.
 - b. PPG Paints; PPG Industries, Inc.
 - c. Sherwin-Williams Company (The)
 2. Gloss and Sheen Level: Manufacturer's standard semigloss finish

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Masonry (Clay and CMUs): 12 percent.

- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.

3.3 INSTALLATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 - 1. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry-Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.

2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 3. Allow empty paint cans to dry before disposal.
 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Interior, institutional low-odor/VOC primer sealer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior latex, institutional low odor/VOC, flat.
- B. Concrete Substrates, Traffic Surfaces:
1. Water-Based Concrete Floor Sealer System:
 - a. First Coat: Matching topcoat.
 - b. Topcoat: Water-based concrete floor sealer.
- C. CMU Substrates:
1. Latex System:
 - a. Block Filler: Interior/exterior latex block filler.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, low sheen.
- D. Steel Substrates:
1. Latex System, Alkyd Primer:
 - a. Prime Coat: Alkyd quick-dry primer for metal.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, semigloss.
 2. Latex over Shop-Applied Quick-Drying Shop Primer System:

- a. Prime Coat: Quick-dry primer for shop application.
- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Interior, latex, semigloss.

END OF SECTION

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SECTION 09965

ELASTOMERIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Elastomeric coatings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Indicate VOC content.
- B. Samples for Initial Selection: For each type of elastomeric coating.
- C. Samples for Verification: For each type of elastomeric coating indicated and in each color and gloss.
 - 1. Submit Samples on same type of substrate as that to receive application, 8 inches square.
 - 2. Apply coats on Samples in steps to show each separate coat, including primers and block fillers as applicable.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Quantity: Furnish an additional 5 percent but not less than 1 gal. of each material, color, and texture applied.

1.4 MOCKUPS

- A. Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 90 deg F unless otherwise permitted by manufacturer's written instructions.
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before starting or continuing coating operation.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace elastomeric coatings that fail within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Water penetration through the coating.
 - b. Deterioration of coating beyond normal weathering.
2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ELASTOMERIC COATINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Benjamin Moore & Co.
 2. PPG Paints; PPG Industries, Inc.
 3. Sherwin-Williams Company
- B. Products: Subject to compliance with requirements, provide product listed in the Elastomeric Coating Schedule for the paint category indicated.
- C. Moisture-Vapor Transmission: Minimum 34 perms, based on testing in accordance with ASTM D1653.
- D. Material Compatibility:
 1. Materials for use within each paint system are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products are recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- E. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
 1. Flat Paints and Coatings: 50 g/L.
- F. Colors: As indicated on the drawings.
- G. Crack Fillers: Elastomeric coating manufacturer's recommended, factory-formulated crack fillers or sealants, including crack filler primers, compatible with substrate and other materials indicated.
- H. Primer: Elastomeric coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.

- I. Concrete Unit Masonry Block Filler: Elastomeric coating manufacturer's recommended, factory-formulated, high-performance latex block filler compatible with substrate and other materials indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with manufacturer's requirements for maximum moisture content, alkalinity, and other conditions affecting performance of work.
- B. Begin coating only when moisture content of substrate is 12 percent or less when measured with an electronic moisture meter.
- C. Begin coating no sooner than 28 days after substrate is constructed and is visually dry on both sides.
- D. Verify that substrate is within the range of alkalinity recommended by manufacturer.
- E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- F. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and coating systems indicated.
- B. Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
 - 1. After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
 - 2. Perform cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.

- D. Crack Repair: Fill cracks in accordance with manufacturer's written instructions before coating surfaces.

3.3 APPLICATION OF ELASTOMERIC COATINGS

- A. Apply elastomeric coatings in accordance with manufacturer's written instructions.
 - 1. Use equipment and techniques best suited for substrate and type of material being applied.
 - 2. Coat surfaces behind movable items the same as similar exposed surfaces.
 - 3. Apply each coat separately in accordance with manufacturer's written instructions.
- B. Primers: Apply at a rate to ensure complete coverage.
- C. Block Fillers: Apply at a rate to ensure complete coverage with pores filled.
- D. Elastomeric Finish Coat(s): Manufacturer's recommended number of coats and total dry film thickness for condition of substrate.
- E. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats similar to color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- F. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform finish, color, and appearance.
- G. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- H. Apply coatings to prepared surfaces as soon as practicable after preparation and before subsequent surface soiling or deterioration.
- I. Spray Application: Use spray equipment for application only when permitted by authorities having jurisdiction. Wherever spray application is used, do not double back with spray equipment to build up film thickness of two coats in one pass.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following testing procedures:
 - 1. Owner will engage the services of a qualified testing agency to sample materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of materials with product requirements.

3. Owner may direct Contractor to stop coating application if test results show materials being used do not comply with requirements. Remove noncomplying materials from Project site, pay for testing, and recoat surfaces that were coated with rejected materials. Remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.
- B. Field Testing and Inspection: Owner reserves the right to engage the services of a qualified testing agency to verify installed thickness of elastomeric coatings.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities, touch up and restore damaged or defaced coated surfaces.

3.6 ELASTOMERIC COATING SCHEDULE

- A. Concrete Unit Masonry Substrates:
 1. Elastomeric Coating System:
 - a. Prime Coat: As recommended in writing by topcoat manufacturer.
 - b. Block Filler: As recommended in writing by topcoat manufacturer.
 - c. Intermediate Coat: As recommended in writing by topcoat manufacturer.
 - d. Topcoat: Elastomeric, pigmented, exterior, water-based, flat coating.
 - 1) Sherwin Williams Conflex Sherlastic used as a basis for design.

END OF SECTION

SECTION 10441

FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.5 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
 - b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Babcock-Davis
 - b. Guardian Fire Equipment, Inc
 - c. Larsen's Manufacturing Company
 2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
 3. Valves: Manufacturer's standard.
 4. Handles and Levers: Manufacturer's standard.
 5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container F.E.: UL-rated 3-A:40-B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
 - 1. Mounting Height: Top of fire extinguisher to be at 42 inches above finished floor.

END OF SECTION

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SECTION 10731

AWNINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fixed awnings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include styles, material descriptions, construction details, fabrication details, dimensions of individual components and profiles, hardware, fittings, mounting accessories, features, and finishes for awnings.

1.3 Delegated Design/Shop Drawings

- A. Contractor will be responsible for providing the Aluminum Awning design based upon the schematic locations indicated on the drawing. Contractor's vendor shall provide engineered, sealed, and signed drawings (State of Florida) for the design. Provide the design drawings as a shop drawing submittal for coordination with the Architect's in-house Structural Engineer to confirm loading for the CMU wall connections.
 - 1. Include plans, elevations, sections, mounting heights, and attachment details.
 - 2. Detail fabrication and assembly of awnings.
 - 3. Show locations for blocking, reinforcement, and supplementary structural support.
- B. Product Schedule: For awnings. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For awnings to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of products.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.7 WARRANTY

- A. Special Warranty: Manufacturer and fabricator agree to repair or replace components of awnings that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including framework.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Awning Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 AWNING FRAME AND ACCESSORY MATERIALS

- A. Aluminum: Alloy and temper recommended by awning manufacturer for type of use and finish indicated and with not less than the strength and durability properties of alloy and temper required by structural loads.
 - 1. Aluminum Plate and Sheet: ASTM B209.
 - 2. Aluminum Extrusions: ASTM B221.
 - 3. Extruded Structural Pipe and Round Tubing: ASTM B429/B429M, standard weight (Schedule 40).
 - 4. Drawn Seamless Tubing: ASTM B210.

- B. Anchors, Fasteners, Fittings, Hardware, and Installation Accessories: Complying with performance requirements indicated and suitable for exposure conditions, supporting structure, anchoring substrates, and installation methods indicated. Corrosion-resistant or noncorrodible units; weather-resistant, tamperproof, vandal- and theft-resistant, compatible, non-staining materials. Provide as required for awning assembly, mounting, and secure attachment. Number as needed to comply with performance requirements and to maintain uniform appearance; evenly spaced. Where exposed to view, provide finish and color as selected by Architect from manufacturer's full range.
 - 1. Lag Bolts: ASME B18.2.1.
 - 2. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers, zinc coated.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

2.3 FIXED AWNINGS

- A. Aluminum Finish: Baked-enamel or powder-coat finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
 - 1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for supporting members, blocking, inserts, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install awnings at locations and in position indicated, securely connected to supports, free of rack, and in proper relation to adjacent construction. Use mounting methods of types described and in compliance with Shop Drawings and fabricator's written instructions.
- B. Install awnings after other finishing operations, including joint sealing and painting, have been completed.

- C. Slip fit frame connections accurately together to form hairline joints, and tighten to secure.
- D. Weld frame connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 - 1. Field Welding: Comply with the following requirements:
 - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - b. Obtain fusion without undercut or overlap.
 - c. Remove welding flux immediately.
 - d. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- E. Anchoring to In-Place Construction: Use anchors, fasteners, fittings, hardware, and installation accessories where necessary for securing awnings to structural support and for properly transferring load to in-place construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come in contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.
- G. Coordinate awning installation with flashing and joint-sealant installation so these materials are installed in sequence and in a manner that prevents exterior moisture from passing through completed exterior wall and roof assemblies.

3.3 CLEANING AND PROTECTION

- A. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 13030
COMPUTER, HARDWARE, SOFTWARE CONTROL BLOCK DESCRIPTIONS

PART 1 - GENERAL

1.01 SCOPE

- A. This section provides functional descriptions of the SCADA system, hardware and programmable logic controllers (PLC) and computers and computer software requirements for the Process and Instrumentation and Control System (PICS) as indicated in specifications and on the drawings. These descriptions are intended to provide an overview of the operating concept of the plant process equipment rather than describing in detail every operating feature, I/O point, or required set-point.
 - 1. NOTE: The terms Remote Terminal Unit "RTU" and Process Logic Controller "PLC" will be used interchangeably.
- B. The Supplier of the PLC (as identified in Section 13100, Programmable Logic Controllers) shall provide all PLC and Human Machine Interface (HMI) programming, and graphic configuration as required for completely functional system in accordance with the contract documents.
 - 1. Programming: The Process and Instrumentation Controls System (PICS) Supplier shall configure and program all hardware and network and communications devices required for an operating system plus any testing software required for the factory test.
 - 2. Control Hierarchy: Several levels and modes of operational control will exist for the system. Operators will have the ability to monitor and control equipment via local manual controls at the equipment, or via the local PLC Operator Interface Terminal (OIT) and through the SCADA computers. The selection of these operational modes will be made available through the use of hardwired and/or software selector switches.
 - a. Manual Control(Local). Hardwired local switches Local–Off-Remote (LOR) (or as shown on plans and noted in detailed loop descriptions) provide selection of Local Manual control, or Remote Manual control (via PLCOIT or via SCADA) control of the equipment. All equipment equipped with Local Manual LOCAL/OFF/REMOTE(LOR) switches in LOCAL will override all Remote PLC and SCADA control. This mode is intended primarily for maintenance functions and is not intended for normal process control operation. When the local switch is in REMOTE, the device is under computer (PLC and / or SCADA) control.

- b. Computer Control. When the equipment LOR switch is placed in the REMOTE position, equipment will be controlled by the PLC in either the REMOTE AUTO or REMOTE MANUAL mode (via a software switch on the PLCOIT or SCADA screen).
 - c. REMOTE MANUAL – The Operator can remotely control equipment through software Start/Stop commands and where applicable, speed control using software switching on the PLCOIT or via SCADA screen. The Start/Stop Command shall be wired as one discrete output and programmed as maintained RUN command.
 - d. REMOTE AUTO – Control is accomplished via PLC or SCADA automatic control logic strategy.
 - e. While in the REMOTE AUTO mode, SCADA and PLCOIT MANUAL commands are not executed by the PLC control logic.
- C. Programming of control logic and configuration of the CONTROL SYSTEM with process graphical screens - human machine interface (HMI) software is part of the Work and shall be the responsibility of the PICS Supplier.

PART 2 - PRODUCTS

2.01 GENERAL

- A. SCADA HARDWARE
 - 1. Integrate with existing computers.
- B. SCADA SOFTWARE
 - 1. General Requirements
 - a. The existing SCADA software shall be configured as directed by the Owner.

PART 3 - EXECUTION

3.01 PLC PROGRAMMING FUNCTIONAL REQUIREMENTS

- A. The following paragraphs describe general configuration tasks that are required for the system PLC(s). These tasks shall be programmed in the applicable PLC. Each PLC may have multiple instances of each of these tasks, or may have no instances of some or all of these tasks. The input/output lists (located in these documents as specified in the Instrumentation and Control System section) and detailed equipment control descriptions (included herein) should be referenced to determine the requirements for each PLC.
- B. PLC or HMI requirements detailed here will not be repeated in the individual control loop descriptions, but are required.

- C. The following paragraphs cover functional requirements of the software, which are generic and may or may not be related to any specific control loop. The requirements apply to both the local OITs and SCADA computers. Control functionality will be identical for all sites.
- D. Abbreviations: The following abbreviations are used in the control descriptions:

1.	AM	Auto-Manual
2.	HOA	Hand-Off-Auto
3.	LR	Local-Remote
4.	LOR	Local-Off-Remote
5.	ES	Emergency Stop
6.	OC	Open-Close
7.	OSC	Open-Stop-Close
8.	OO	On-Off
9.	PV	Process Variable
10.	SP	Set Point (variable)

- E. Available Process Values: All generated process alarm, equipment status, and process variable values associated with a particular PLC shall be available at its OIT and also on SCADA HMI including remote displays (PCWS). Refer to HMI specification for additional requirements.
- F. Flow Totalized Values: Flow values shall be integrated, totalized, and stored in the PLC registers so the values displayed on the PCP OIT and SCADA computers will be identical.
1. For each flow meter whose analog “flow” signal is monitored by a PLC or for any calculated flow signal utilized for process control and monitoring, internal flow totalization shall be accumulated by the respective PLC. The flow totalization routine shall utilize floating point variables to accomplish the flow integration.
 2. Two (2) flow totals shall be accumulated and accessible from the PLC. The current 24-hour period total, the previous 24-hour period total shall be calculated and stored. The 24-hour total shall reset at midnight.
 3. The flow total values shall be displayed on the OIT.

- G. System Failure: Failure of a PLC shall result in safe shutdown of associated process equipment. Interposing relays shall be provided where required to assure that equipment will revert to its fail-safe condition. Failure of any PLC or its communication shall be alarmed.
- H. Rack/Module Configuration: The rack and module definitions for each PLC, as well as the PLC communications configuration shall be completely configured to allow proper addressing of all field connected I/O points. This shall include configuration of any remote input/output (RIO) racks.
- I. PLC Database Definition: The PLC database will include both field I/O points and internally generated points required for programming. All field I/O points and internal programming points shall be fully defined according to database naming conventions approved by ENGINEER and OWNER. As a minimum, each database point shall be provided with a tag name, engineering unit, alarm parameters, and description. Internally generated points (calculations) and set-point variables shall be provided as required whether specified in the control descriptions or not. All process and timer set points shall be Operator adjustable from the OIT.
- J. Analog Scaling: Each analog input and output will be appropriately scaled in engineering units for use in internal PLC programming and monitoring by the PLC OIT and remote SCADA computers.
- K. Equipment Runtimes: For each equipment item whose "run" status is monitored by a PLC, an internal equipment runtime shall be accumulated by the respective PLC. The runtime procedure will monitor the status of the equipment "run" contact and, when the equipment is running, increment a software timer that maintains equipment runtime to within a one-minute resolution. The timer shall stop incrementing, but not reset, when the "run" contact indicates that the equipment is not running. The timer value shall increment an hour counter that maintains a floating point value representing the equipment run time in hours and tenths of hours. The counter value shall be available for display on the PLC OIT and SCADA computer. A manual reset of the runtime value shall be available at the PLC OIT for personnel at the supervisor level and above.
- L. Equipment Starts: For each equipment item whose "run" status is monitored by a PLC, an internal equipment number of 'Starts' shall be accumulated by the respective PLC. The runtime procedure will monitor the status of the equipment "run" contact and, when the equipment is running, increment a software counter that maintains equipment 'starts'. The counter value shall be available for display on the OIT and SCADA computer. A manual reset of the value shall be available at the HMI for personnel at the supervisor level and above.
- M. Change-of-State Alarms: While equipment is controllable from the PLC (IN REMOTE), discrete output commands shall be compared to their respective process feedback status signal (where available) to verify proper execution. If the feedback status does not match the most recent output command (after

an adjustable time delay), an alarm message shall be displayed on the HMI computer and transmitted to SCADA. The alarm shall remain energized until the proper discrete condition is sensed and until the operator resets the alarm.

- N. Equipment Availability: In general, equipment with PLC control has been provided with a local HOA, HOR, LR, or LOR selector switch that transfers control to the PLC. The PLC shall monitor the position of this local selector switch to determine if the equipment is available for PLC control. If more than one 'switch' or availability condition exists, the 'switches' shall be series hard-wired such that a single signal shall indicate that the equipment is available for PLC control. If the equipment is not available, the PLC program shall not attempt to implement remote manual or automatic status changes for the equipment. The PLC program may, however, need to implement special routines if equipment unavailability affects a sequence (as described in the detailed equipment descriptions).
 - 1. Upon:
 - a. Transmitter Failure: Analog signal less than 2 mA or greater than 22 mA.
 - b. Pump/Motor Failure: The PLC shall automatically remove its Call-to-Run and if applicable, set its analog set-point value to a minimum value.
 - c. An alarm shall be generated on any failure.
- O. Maintained/Momentary Outputs: The need for maintained or momentary control outputs shall be determined from the input/output listing and the electrical schematics. In general, equipment with only one PLC control output point indicated in the I/O list shall be programmed for a maintained control output. Equipment with two (or more) control outputs shall be programmed for momentary outputs as required. Provisions shall be made, in either case, to remove the active state (start, open, forward, initiate, etc.) control output when an equipment failure is sensed or when the equipment transitions from available to unavailable (local switch change).
- P. Power Failure: A utility power failure is detected by the PLC UPS running from battery power.
 - 1. Upon detection of utility power failure:
 - a. A power failure alarm is generated.
 - 2. All PLC controlled equipment is turned off until main power has been restored for 30 seconds.
 - 3. Upon power restoration for 30 seconds:
 - a. A power restored alarm is generated.
 - b. Devices will remain in their current configuration. Note that an equipment REMOTE AUTO / REMOTE MANUAL mode may

- be altered during the power outage if designated in the detailed control strategy.
 - c. All devices will require Operator intervention (via PLC OIT or SCADA) to restart the equipment when not in REMOTE AUTO mode.
 - d. All devices over 20 HP shall be stagger-started according to control strategy details.
 - e. Control strategy details shall provide additional (if required) actions to occur upon power restoration.
- Q. Manual/Auto Bumpless Transfer: Unless otherwise indicated in the equipment control descriptions, equipment changes from automatic to manual control shall be bumpless. Equipment running or stopped in automatic mode shall remain running or stopped when manual mode is selected.
- R. PLC Peer to Peer Ethernet Communications: Each PLC shall monitor peer-peer PLC communications required for process control of an equipment system distributed among multiple PLCs. Communications failures shall be detected, alarmed, and acted upon in accordance with detailed strategy requirements.
- S. PLC Low Battery: An alarm shall be generated on PLC low memory low battery detection.
- T. PLC Generated Alarms: Alarms from each PLC shall be logged into the PLC OIT alarm log table and displayed as described below. This requirement will not be restated in the individual control loop descriptions.
- U. Instrument Calibration: Provide the ability to place all field instruments in a CALIBRATE mode at the SCADA system or OIT. The PLC will hold last value of the field instrument to allow the plant to operate.
- V. PLC Out of Service mode: An alarm shall be generated on SCADA system when the PLC is taken out of service.

3.02 OIT FUNCTIONAL REQUIREMENTS

- A. The following paragraphs describe general configuration tasks that are required for the OIT and related software.
1. Database: The system database, including field I/O and internal points shall be established according to the database point naming conventions approved by OWNER. Database generation for field I/O shall include all required coordination with PLC level addresses. All calculated totals, averages, daily totals, etc. calculated by the PLC in Section 3-1 shall be displayed on the OIT.
 2. Alarms: Complete system alarming shall be configured. This shall include configuration of graphical alarm displays, and configuration of

audible alarms as available. All process or system alarms shall appear on a dedicated alarm summary screen.

- a. For LOW or LOW-LOW analog or discrete alarms which do not apply if the associated equipment is not operating, provisions shall be made to prevent generation of these alarms. This shall include alarms such as low amperage alarms for pumps that are not running. This may also include low flows or pressures when associated pumps are not operating (this will only apply if periodic operation of the equipment is considered normal).
 - b. All alarms/events shall be time stamped when displayed or printed. Unacknowledged alarms shall not automatically clear from the alarm summary if they return to normal before being acknowledged.
- B. Manual Entry of Data: The OIT shall allow manual entry data of all ENGINEER and OWNER designated set-points, and process control variables. These variables shall be password protected as indicated in the control descriptions.

3.03 EQUIPMENT CONTROL AND CONTROL MODE OVERVIEW

- A. The following paragraphs explain the general format and control modes that are used in the detailed equipment descriptions. These paragraphs apply to the attached, project specific, equipment control descriptions included herein.
- B. Descriptions for control are included in the detailed equipment control descriptions. They are provided primarily for overview information and guidance to show intent for the PICS Supplier. The PICS Supplier are responsible for all detailed programming requirements for safe and proper operation of the equipment provided by them under all conditions.
 1. PICS Supplier and ultimately the CONTRACTOR shall be responsible for all coordination issues between their systems to insure they work together in a seamless operation.

3.04 DETAILED EQUIPMENT CONTROL DESCRIPTIONS

- A. The following paragraphs describe functional requirements for various software control blocks in the control system. These descriptions are intended to provide an overview of the operational concept for the facilities, rather than describing in detail every operating feature, requirement, or interlock. The programmer is to provide a functioning system, including failure recovery, whether completely or explicitly stated in the control descriptions.
- B. Introduction: The purpose of the control strategy is to provide a detailed description of the control, monitoring and alarm functional requirements associated with each process loop for the plant control system (PCS) to operate all the processes associated for the operation of the facility.

- C. The process loop number is determined by the ISA tag name. Table 1 provides a cross-reference between the process loop and the associated control strategy.

Each control strategy is divided into sections:

1. Overview:

This section provides a basic performance description as an introductory guide.

2. Monitoring and Control:

This section provides required equipment operation status, current process variable measurements, totaling process variable measurements, and active equipment control mode status that are to be monitored ('Monitor' does not include alarms):

- a. Equipment operation status includes OPEN or CLOSED position; ON or OFF; and LOW, HIGH or OFF. (OFF is also referred to 'READY' in the electrical schematics wiring diagrams.)
- b. Current process variable measurements include level, pressure,
- c. Totaling process variable measurements include daily, monthly, and annual total measurements; as well as, equipment (pumps) cumulative runtimes for daily, weekly, monthly and yearly runtimes.
- d. Active equipment control mode status includes REMOTE selected in the field; MANUAL or AUTO selected from the control system interface; PID controller's set point and output; operator entered parameters for control algorithms (such as dosage, timers, etc.); current sequence steps.
- e. Local (Manual) Display/Control: For equipment and valves that have Local Control Stations (LCS), Local Control Panels (LCP) or Motor Control Panels (MCPs), the Local/Off/Remote (L/O/R) hand switches dictates where the equipment or valves are controlled. In LOCAL Mode, the control is from the LCS, LCP or MCP via Open/Close pushbuttons or Start/Stop pushbuttons and also speed potentiometers.

3. Remote Control:

- a. Manual - In this mode the LCS or LCP must be in REMOTE Mode REMOTE MANUAL Mode – control is forwarded to the OIT. Equipment and valves do not operate automatically but must be "pulsed" open/close (for valves and slide gates) or equipment started/stopped manually. Typical POP-UP graphic templates shall be utilized for all valves, slide gates, pumps, equipment, etc.

- b. Auto - Same as Remote Manual Control except: In REMOTE AUTO Mode – control of equipment and valves are controlled automatically from the PLC as defined below:

- i. Control: This section provides required modes of equipment operation, mathematical algorithms, proportional-integral-derivative (PID) controller, and sequencing steps. This section assumes the equipment is placed in AUTO or REMOTE (from the field). If the equipment is not in REMOTE then the described controls are disabled and the equipment is not available for the OIT. The OIT shall alert the operator defining the problem area or piece of equipment Not-In-Auto Mode or that is not functioning properly.

4. Transfer:

This section provides the functional requirements of transferring from one control mode to another control mode. For example, bumpless transfer is the ability to seamlessly go from one mode to another mode without interrupting the equipment operation.

- a. Active equipment control mode status includes AUTO or REMOTE selected in the field; MANUAL or AUTO selected from the control system interface; PID controller's set point and output; operator entered parameters for control algorithms (such as dosage, timers, etc.); current sequence steps.

5. Interlock:

This section provides required control interaction between two or more devices and override functions to protect equipment and process performance under normal operations. It also provides the necessary action to be taken if E-STOP is activated. 'Interlocks' do not include override actions caused by field generated alarms, equipment or instrument failure, and total plant or area power outage.

6. Alarms:

- a. Alarm: This section provides required annunciation, control action and priority of field generated alarms, logic generated alarms, and logic generated warnings. Logic generated alarms and warnings are identified in the control strategy. These alarms include:
- b. OOR Analog Input: For all analog inputs, issue an Out of Range (OOR) alarm if an analog input is outside of the 4 to 20 mA range for 30 seconds.
- c. FAIL-to-CLOSE: If a CLOSE command is issued and there is no CLOSE status feedback to indicate valve has reached full

- closed position within 45 seconds or the CLOSE status is not present while valve is commanded to CLOSED position, then issue a FAIL-to-CLOSE alarm.
- d. FAIL-to-OPEN: If an OPEN command is issued and there is no OPEN status feedback to indicate valve has reached full open position within 45 seconds or the OPEN status is not present while valve is commanded to OPEN position, then issue a FAIL-to-OPEN alarm.
 - e. FAIL-to-RUN: If a START command is issued and there is no ON status feedback to indicate device has started within 45 seconds or the ON status is not present while device is running, then issue a FAIL-to-RUN alarm.
 - f. FAIL-to-STOP: If a STOP command is issued and there is still an ON status feedback after 45 seconds from issuing a STOP command, then issue a FAIL-to-STOP alarm.
 - g. FEEDBACK FAILURE: A PID controller modulates a valve position or pump speed to maintain a process set point under AUTO mode and the controller's feedback used to determine off set from set point is $\pm 5\%$ from the set point for 45 seconds then issue a FEEDBACK FAILURE alarm.
 - h. FORCE OVERRIDE: A failure condition occurs that requires the control logic to override a calculated value used for controlling a device such as valve position or pump speed, etc.
 - i. NO STANDBY AVAILABLE: The control strategy has a 'duty' and 'standby' or Lead/Lag service operation under AUTO mode and there is only one pump available for AUTO control then issue a NO STANDBY AVAILABLE warning.
 - j. TRACKING FAILURE: A variable speed device or modulating valve is commanded to a speed or position percentage and the feedback from the drive tachometer or actuator positioner is $\pm 5\%$ from the commanded speed or position for 45 seconds then issue a TRACKING FAILURE alarm.
 - k. POWER OUTAGE FORCED STOP: The equipment was running under PLC control in MANUAL mode prior to loss of power and due to the power outage, the equipment was stopped. Issue a POWER OUTAGE FORCED STOP alarm upon this condition.
7. Fault Mode: This section provides the functional control requirements in the event that there is an equipment or instrument failure. An equipment failure is defined as the inability to control or monitor a device placed under REMOTE control due to an alarm condition. An instrument failure is defined as the inability to monitor a device due to an alarm condition.
8. Power Outage: This section provides functional control requirements in the event of a loss of power and the functional control requirements

upon power restoration. This section assumes a power outage to be detected by the transfer of normal to generator power for all processes.

- D. HMI Generated Alarms: In addition, alarm priority levels are assigned a number from 1 to 4. The numbers are categorized by the urgency of the alarm condition and are as follows:

PRIORITY	DESCRIPTION
1	Human safety in Danger/Chemical Spill Potential/Toxic Gas Leak.
2	Equipment or system failure; or interlock to shutdown equipment to prevent mechanical damage.
3	Control override to prevent jeopardizing process performance or possible mechanical damage.
4	Warning of potential problem effecting process performance or possible mechanical damage.

- E. Introduction to Control Description:

The purpose of the control strategy is to provide a general description of the control, monitoring and alarm functional requirements associated with each process loop for the Plant's control system (PCS) to operate the following processes:

1. Existing Process Equipment
 - a. General
 - i. The influent pump station control panels and drives are furnished by others. The PCS supplier will monitor all status and alarms of the pumping system, create a graphic, trending, and historical database.
 - b. Control Strategy
 - i. The existing pumping and aeration rotor and gate control strategies shall be unaffected except the motor starting and speed control devices will be relocated to a proposed electrical building. The pseudo-operations shall be duplicated in the proposed PLC-E1 except signals from field devices in the existing plant shall remain and re-messaged to PLC-E1.

2. Proposed Process Equipment

a. General

- i. This project includes the addition of two (2) aeration rotors and two (2) sludge mixing blowers. The control strategies shall be as follows:

- ii. Aeration Rotors

- I. Include the automatic control and speed of each rotor as directed by the Owner

- iii. Sludge Mixing Blowers

- I. The variable speed blowers shall be controlled by the PCS system based on operator setpoints. The sequence of operation is as follows:

- a) The plant operator the local HOR in the Remote position.
 - b) The plant operator set the desired speed of each blower.
 - c) The plant operator will set the local drives in remote control.
 - d) The operator will start and stop, adjust speed as needed.

- II. Interlocks

- a) Any blower shall not run if local HOR switch is in the OFF position.

- III. Graphics

- a) A full graphic is required for full control of the truck loading pumps.

3. Electrical/Generator Systems

- a. The PCS shall monitor the normal and emergency position of the automatic switches and the auto position of the generator controls. The fuel tank level will be monitored, including the leak detection systems. The volts and amps of the main breaker and main distribution panels will be displayed on the plant graphics.

END OF SECTION

**SECTION 13060
FIBER OPTIC CABLING**

PART 1 - GENERAL

A. DESCRIPTION

1. Scope:
 - a. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install fiber optic cabling, including fiber testing procedures, accessories and splicing requirements.

B. REFERENCES

1. Standards referenced in this Section are listed below:
 - a. ASTM D 1248, Specification for Polyethylene Plastics Molding and Extrusion Materials.
 - b. ASTM D 1603, Test Method for Carbon Black in Olefin Plastics.
 - c. ASTM D 1765, Classification System for Carbon Blacks used in Rubber Products.
 - d. ASTM D 3349, Test Method for Absorption Coefficient of Ethylene Polymer Material Pigmented with Carbon Black.

C. SUBMITTALS

1. Shop Drawings: Submit the following:
 - a. Cut sheets and catalog literature for proposed fiber optic cable, and fiber optic cable accessories (terminations).
 - b. Manufacturer specifications and data, which clearly and unambiguously shows that the fiber optic cable meets all the requirements specified herein.
 - c. Samples of the proposed cable.
 - d. Physical dimension drawings of all fiber optic accessories.
 - e. Proposed fiber identification sequence and labeling.
 - f. Provide a Recommended Spare Parts List (RSPL).

D. MAINTENANCE

1. Provide off-line maintenance aids and on-line diagnostics to check the performance of the communication links and interfaces of devices on the data highway.
2. Provide a list of recommended special tools for fiber installation, testing or maintenance.
3. One hand-held optical light source with ATT-compliant SC adapters, Siecorm (Corning) Model OS-100S test set, or equal.

4. 4. One hand-held optical power meter with ATT-compliant SC adapters, Siecor (Corning) Model OM-100S, or equal.

PART 2 - PRODUCTS

A. FIBER OPTIC CABLE SUMMARY SPECIFICATIONS

1. The fiber optic cable shall meet the following summary specifications:
 - a. Fiber Type: Multimode
 - b. Fiber Count: 6
 - c. Cable Weight: 49 lbs/1000 ft
 - d. Buffer Type: Tight Buffered.
 - e. Cable Fill: Gel-Free .
 - f. Maximum Pulling Load: 600 lbs (2700 N).
 - g. Operating Temperature Range: -40°C to +70°C.
 - h. Parallel Plate Crush Resistance: 1,800 N/cm.
 - i. Packaging: Spools/reels, protected from shipment.
 - j. Outdoor
 - k. Connectors; SC
2. Fibers within the cable shall be color-coded so that each fiber may be individually identified. The color sequence suggested is as follows: blue, orange, green, brown, slate, white, red, black, yellow and violet. Dashed versions of the same colors may be used to continue the sequence, depending on the cable structure and fiber count.
3. The outer jackets of the cable shall be continuous, free from holes, splits, blisters or inclusions. The same requirement holds for any inner jackets within a given cable structure as well as for fiber coatings.
4. Materials used for fiber optic cable shall present no environmental or toxicological hazards as defined by current industry standards and shall comply with OSHA and EPA standards or applicable federal or state laws or regulations.
5. The color of the polyethylene outer jacket material shall be black in accordance with ASTM D 1248, and contain a suitable antioxidant substance. The carbon black used shall be furnace-type conforming to designation N 110 in accordance with the requirements of ASTM D 1765. The carbon black content in the jacket material when measured in accordance with the requirements of ASTM D 1603 shall be 2.6 percent ± 0.25 percent by weight. The light absorption coefficient of the jacket material shall be at least 400 when measured at a wavelength of 375 nm in accordance with the requirements of ASTM D 3349.

- a. Outer polyethylene jacket materials shall meet tensile strength and elongation minimum requirements for unaged and aged samples as follows:
 - i. Tensile Strength at Break: 2800 psi (Unaged), 2100 psi (Aged).
 - ii. Elongation at Rupture: 400 percent (Unaged), 375 percent (Aged).
- 6. The cable jacket shrinkage test measures the shrinkage or expansion of a cable jacket exposed to temperature aging for a specified period of time. Maximum shrinkage shall be less than five percent for each specimen tested. The test procedure is described in EIA-RS-455, FOTP-86.

B. CABLE PACKAGING

- 1. The cable shall be permanently marked to identify the manufacturer, date of manufacture, length markings, a product identification code, and UL messages, where appropriate. The markings shall be printed at regular intervals of not more than two feet apart.
- 2. The cable shall be packaged on a reel with inner hub diameter greater than the recommended minimum bending diameter of the cable. The anchor holes on the reels shall admit a 2-1/2-inch diameter spindle without binding. The package shall be sturdy enough to endure reasonable handling in the process of shipping and storage. The package shall bear the name of the manufacturer, the product identification code and the total amount of product on the reel.
- 3. The following information shall be securely attached to the reel as a tag or clearly and permanently stenciled or labeled on each reel:
 - a. Customer Order Number.
 - b. Customer Job Number.
 - c. Customer Reel Number.
 - d. Termination.
 - e. Ship Date.
 - f. Manufacturer's Name.
 - g. Factory Reel Number.
 - h. Manufacturer's Cable Code (Type and Fiber count).
 - i. Length of Cable.
 - j. Weight of Cable and Reel.
 - k. Defect Tag.
- 4. The ends of all cable shall be sealed to prevent the escape of filling compound and to prevent the entry of moisture during shipping, handling, storage and installation.

C. ADDITIONAL FIBER

1. The fiber count of the cable shall be 12, 24 or 72 fibers, as specified above. Each fiber will be tested at the completion of cable installation to verify that there are, indeed, 12, 24, 72 fibers, which conforms to these Specifications.
2. CONTRACTOR may, at their own expense, furnish a cable with more than the specified numbers of fibers to allow for accidental fibers damaged during installation.

D. FIBER OPTIC CABLE MANUFACTURER

1. Manufacturers: Provide products of one of the following:
 - a. Corning
 - b. Lucent.
 - c. Or equal.

E. MANUFACTURER TEST DOCUMENTATION

1. Test documentation from the fiber optic cable manufacturer shall be delivered to the ENGINEER upon delivery of the cable to the Site, as a prerequisite for cable installation.
2. The documentation shall include Optical Time Domain Reflectometer (OTDR) traces for each fiber of each reel at 850 nm and 1300 nm. Optical attenuation test data shall be furnished for each fiber of each reel, as measured at 850 nm and 1300 nm.

F. PRE-INSTALLATION TESTING

1. CONTRACTOR shall test the fiber optic cable prior to its installation. This testing shall be witnessed by the ENGINEER.
2. Testing shall consist of making an OTDR trace of each fiber of each reel, at both 850 nm and 1300 nm. The test shall incorporate a one km long backscatter suppression cable inserted between the OTDR and the fiber end. Each trace shall include the optical length and average attenuation.
3. The results of the testing shall be submitted to the ENGINEER prior to installation. Any cable that shows "out-of-spec" performance shall be replaced, at no additional cost to the OWNER or delay to the Project Schedule.

G. CABLE TERMINATION ENCLOSURE AND HARDWARE

1. Cable termination enclosures shall be furnished and installed at each site accessed by fiber optic cable. The enclosures shall be used to terminate each fiber of the cable.
2. The enclosures/cabinets shall be the 19-inch EIA rack mounted type having provisions for terminating multiple fiber optic cables. Splice trays, strain relief cable attachment points, fiber organizers and bend radius hardware shall be furnished within each termination cabinet. The cabinets shall be furnished with an integral lock to prevent

unauthorized entry. All locks shall be keyed identically, two keys shall be furnished for each cabinet installed.

3. The enclosure cabinets shall house a patch panel internally. The patch panel shall swing out for ease of use. Panel size shall be suited to the number of fibers in the cable, for both directions. Bayonet/flanged couplings shall be furnished and mounted for each fiber to be terminated.
4. The termination enclosure shall have a swing-down front door that provides access to all splice trays and patch panels. They shall be sized to accept 12, 24 or 72 fiber cables and provide space for unstripped, coiled cable, each being up to 25 feet long.
5. The cable termination enclosures and hardware shall be manufactured by Corning, Ditel, or equal.

H. PIGTAIL CABLES AND CONNECTORS

1. Each of the fibers shall be terminated by splicing pigtails in the termination enclosures.
2. Pigtails shall be nine feet long. They shall be single mode for operation at 850 nm and 1300 nm, loose-buffered and manufactured from fiber meeting these Specifications described for the main cable.
3. All connectors shall be identical. They shall be SC-Type, or equal.

I. SPLICING

1. CONTRACTOR shall field splice each fiber to a pigtail cable at the termination enclosures. All splices shall be made by the fusion process and shall have a splice loss no greater than 0.35 dB. Loss measurement shall be performed at the time of splicing and documentation shall be furnished for each splice. Splice testing shall be witnessed by the ENGINEER.
2. Prior to stripping the cable, CONTRACTOR shall record the cable length from the cable jacket. This length shall be documented and included in the test documentation, specified elsewhere.

PART 3 - EXECUTION

A. CABLE INSTALLATION

1. All fiber optic cable shall be installed, terminated, and tested by the fiber subcontractor specified above.
2. In pulling the cable, strain-release, or other tension limiting devices shall be used to limit the pull tension to less than 600 pounds. The ENGINEER shall witness the cable being pulled.
3. Minimum bend radius restrictions shall be satisfied both during and after cable installation.

4. All conduit and cabinet entrances shall be sealed with RTV or other re-enterable sealant material to prevent ingress of water, dust or other foreign materials.
5. Splices in the fiber optic cable shall only be made at termination points where connectorized pigtails are applied. Non-terminating field splices shall not be made, unless authorized by the ENGINEER, in writing. If a field splice is required, it shall be fusion spliced and placed in a buried pull box. Closures shall be AT&T UCB1 with Type 2000 outer case, ATL, Corning (Siecor) SCF, or equal. Encapsulant shall be placed between inner and outer closures. Such splices shall meet the loss parameters/testing requirements specified elsewhere.
6. The ends of all cable shall be sealed to prevent the escape of filling compound and to prevent the entry of moisture during installation.
7. At each well site pull box provide an additional 30 feet of fiber cable and rack on cable loop managers.
8. Provide a minimum of 3 feet separation between the fiber conduit and any water or drain piping.
9. Provide a warning tape a minimum of 3 feet above the fiber conduit and location wire.
10. All fiber conduit ells shall be long radius.
11. At each splice box provide fiber closures installed and made ready for future cable splices.
12. Coordinate network connections related to any outages with the County.

B. CABLE DAMAGE DURING INSTALLATION

1. If the cable becomes damaged during installation, CONTRACTOR shall stop their operations and notify the ENGINEER, in writing, immediately. The OWNER and ENGINEER will decide whether to replace the entire reel of cable or to install a splice at the damaged section.
2. If the OWNER decides to replace the entire reel of cable, CONTRACTOR shall begin the installation at the last designated splice point. The damaged cable between these points shall be removed, coiled, tagged, and given to the OWNER. Installation of new cable to replace damaged cable shall not be a basis of extra payment or Contract completion time. In addition to installation of the new cable, CONTRACTOR shall reimburse the OWNER and entire cost of the replacement reel of cable. This cost will be withheld from the Contract price.

3. If the OWNER decides to install a splice at the damaged point, and the cable is damaged a second time, the entire reel of damaged cable (and all subsequent damaged reels) shall be replaced with new reels at CONTRACTOR'S expense.

C. CABLE ACCEPTANCE TESTING

1. Acceptance testing of the data highway (fiber and electronic equipment) shall be conducted as a part of integrated system field-testing. Prior to such tests, however, the fiber optic cable shall be tested as specified herein.
2. The fiber subcontractor shall retain the services of an independent fiber optic cable testing agent to test the cable and certify the installation. All testing shall be witnessed by the ENGINEER and the OWNER. A test plan shall be submitted at least one week prior to the proposed test date(s). The test plan and procedures shall be mutually agreed upon prior to conducting the tests.
3. Each optical fiber in every span shall be tested after installation and termination. For each fiber, an OTDR trace hardcopy is required. This end-to-end trace shall be performed from BOTH ends of the fiber. The traces shall be made at 850 nm and 1300 nm. Also for each fiber, and end-to-end power attenuation (insertion loss) test shall be performed from BOTH ends of the fiber. The attenuation test shall use a stabilized optical source and an optical power meter calibrated to the appropriate operating wavelength (850 nm and 1300 nm).
4. For each installed fiber, the power attenuation shall not exceed the following, tested from connector to connector at the respective patch panels, at 850 nm and 1300 nm. For the 1300 nm test, substitute 0.0020 for 0.0035 in the first term of the equation.

$$(0.0035)L + (0.35)N + 3.0 \text{ dB}$$

where L = the length of the fiber in meters, and
N = the number of fusion splices in the fiber.

5. Any fiber optic cables containing one or more fibers not meeting this performance will not be accepted by the OWNER, and shall be repaired or replaced at no additional cost to the OWNER.
6. All fiber optic testing shall be documented on pre-approved test forms. Three copies of all documents (including OTDR traces) shall be submitted to the ENGINEER upon successful completion of the testing.
7. Work at the termination cabinets shall be performed such that the fiber optic cables, and the fibers, are not subjected to undesirable bending both during the Work and when permanently fixed in place. The cables, fibers, pigtails, etc. shall be organized in a neat and

orderly fashion within the enclosure. Inspection of the Work shall be performed by the ENGINEER. Unsatisfactory Work shall be reworked.

END OF SECTION

SECTION 13070
PANEL MOUNTED INSTRUMENTS AND DEVICES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish, install, calibrate, test, adjust and place into satisfactory operation panel instruments and devices.
 2. Contract Documents illustrate and specify functional and general construction requirements of the panel components and do not necessarily show or specify all components, wiring, piping and accessories required to make a completely integrated system. CONTRACTOR shall provide all piping, wiring, accessories and labor required for a complete, workable and integrated system.
- B. Coordination: Coordinate the installation of all items specified herein and required to ensure the complete and proper interfacing of all the components and systems.

1.02 QUALITY ASSURANCE

- A. Comply with the requirements of Section 13600, Process Control System General Provisions.
- B. Acceptable Manufacturers:
1. Furnish instruments and devices by the named manufacturers or equal equipment by other manufacturers.
 2. The named manufacturers have been specified to establish the standard of quality and performance of the equipment to be supplied.
 3. Obtain all instruments or devices of a given type from the same manufacturer.
- C. Manufacturers' Responsibilities and Services:

1. Design and manufacture the instruments and devices in accordance with the applicable general design requirements specified in Section 13600, Process Control System General Provisions, and the detailed Specifications herein.

1.03 SUBMITTALS

- A. Comply with the requirements of Section 13600, Process Control System General Provisions.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements specified in Section 13600, Process Control System General Provisions.
- B. Instruments and devices shall not be assembled in the panels until all product information and system Shop Drawings for respective components have been approved.

1.05 IDENTIFICATION TAGS

- A. All panel instruments and devices shall have an identification tag meeting the following requirements:
 1. Tag numbers shall be as listed in the Instrument Index.
 2. Identifying tag number shall be permanently etched or embossed onto a stainless steel tag which shall be fastened to the device housing with stainless steel rivets or self tapping screws of appropriate size.
 3. Where neither of the above fastenings can be accomplished, tags shall be permanently attached to the device by a circlet of 1/16-inch diameter stainless steel wire rope.
 4. All instruments and devices mounted within panels shall have the stainless steel identification tag installed so that the numbers are easily visible to service personnel. Front of panel mounted components shall have the tag attached to the rear of the device.
 5. Front of panel mounted components shall have nameplates, which comply with the requirements specified in Section 13090, Process Controls Panels and Enclosures.

PART 2 - PRODUCTS

ARTICLE INSTRUMENT TITLE

- 2.01 Power Supplies.
- 2.02 Uninterruptible Power System.
- 2.03 Pushbuttons, Selector Switches and Indicating Lights.
- 2.04 Digital Indicator.
- 2.05 Analog Indicator.
- 2.06 Cycle Timer.
- 2.07 Electronic Totalizer and Integrator.
- 2.08 Elapsed-Time Meter (Hour meter).
- 2.09 Control Relay.
- 2.10 Time Delay Relay.
- 2.11 Current Alarm Relay.
- 2.12 Current Isolator.
- 2.13 Adder.
- 2.14 Multiplier/Divider.
- 2.15 Electronic Square Root Extractor.
- 2.16 Current and Voltage Transducer.
- 2.17 Watt Transducer.
- 2.18 Manual Loading Station.
- 2.19 Operator Interface (OIT)
- 2.20 Ethernet/Network Switch
- 2.21 Fiber-To-Copper Media Converters
- 2.22 Fiber Optic Patch Panels
- 2.23 Autodialer
- 2.24 Strip Chart Recorders
- 2.25 Spare Parts and Test Equipment.

2.01 POWER SUPPLIES

- A. General: Single unit and multiple unit power supplies, located in control room panels, remote terminal units and field panels as required.
- B. Single Unit Required Features:
 - 1. Solid state circuitry.
 - 2. Surface mounting.
 - 3. Input Power: 120 VAC $\pm$ 10 percent, 60 Hz.
 - 4. Output Power: 24 VDC or as required.
 - 5. Line/Load Regulation: $\pm$ 0.005 percent.
 - 6. Ripple: 0.25 mV RMS.
 - 7. Polarity: Floating output.
 - 8. Ambient Temperature: -20°C to +71°C.
 - 9. Response Time: <20 μ S.
 - 10. Overload Protection: Internal preset.
 - 11. Include mounting brackets, fuse, and mating connector for AC power plug.
 - 12. UL 508 listed.
 - 13. Failover discrete signal monitoring capability to be provided at SCADA for all power supplies within each control panel.
- C. Products and Manufacturers: Provide one of the following:
 - 1. Phoenix Quint

2.02 UNINTERRUPTIBLE POWER SYSTEM

- A. Ambient
 - 1. Degree of protection IP20

2. Inflammability class in acc. with UL 94 (housing / terminal blocks)
V0
3. Ambient temperature (operation) -25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
4. Ambient temperature (start-up type tested) -40 °C
5. Ambient temperature (storage/transport) -40 °C ... 85 °C
6. Max. permissible relative humidity (operation) ≤ 95 % (at 25 °C, non-condensing)
7. Climatic class 3K3 (in acc. with EN 60721)
8. Degree of pollution 2
9. Installation height ≤ 5000 m (> 2000 m, observe derating)

B. General

1. Efficiency typ. 93.9 % (400 V AC)
2. typ. 93.8 % (480 V AC)
3. MTBF (IEC 61709, SN 29500) > 985000 h (25 °C)
4. > 638000 h (40 °C)
5. > 311000 h (60 °C)
6. Insulation voltage input/output 4 kV AC (type test)
7. 2.4 kV AC (routine test)
8. Insulation voltage input / PE 3.5 kV AC (type test)
9. 2.4 kV AC (routine test)
10. Insulation voltage output / PE 0.5 kV DC (type test)
11. 0.5 kV DC (routine test)
12. Degree of protection IP20
13. Protection class I

14. Inflammability class in acc. with UL 94 (housing / terminal blocks)
V0

15. Mounting position horizontal DIN rail NS 35, EN 60715

C. Approvals

1. UL approvals UL Listed UL 508

2. UL/C-UL Recognized UL 60950-1

3. UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

D. Manufacturer:

1. APC

2.03 SELECTOR SWITCHES, PUSHBUTTONS AND INDICATING LIGHTS

A. General:

1. Selector switches, pushbuttons and indicating lights shall be supplied by one manufacturer and be of the same series or model type for all the panels provided in this Contract. Equipment Suppliers shall coordinate with CONTRACTOR to provide same series or model type of switches, pushbuttons and indicating lights.

2. Type:

a. Heavy duty, oil tight.

3. Provide legend plate for indication of switch, pushbutton or light function (e.g., "OPEN-CLOSED", "HAND-OFF-AUTO").

4. Mounting: Flush mounted on control panel front, unless otherwise noted.

5. NEMA rated to match panel in which mounted.

B. Selector Switches:

1. Type: Provide selector switches with number of positions as required to perform intended functions as shown and specified.

2. Contacts:

- a. Provide number and arrangement of contacts as required to perform intended functions specified, but not less than one single pole, double throw contact.
 - b. Type: Double break, silver contacts with movable contact blade providing scrubbing action.
 - c. Rating: Compatible with AC or DC current with devices simultaneously operated by the switch contacts, but not less than 10 A resistive at 120 VAC or DC continuous.
- 3. Switch Operator: Standard black knob.
- C. Pushbuttons (Standard or Illuminated):
 - 1. Type: Provide momentary lighted and/or unlighted, single and/or dual type pushbuttons as required to perform intended functions specified and shown.
 - 2. Contacts: Comply with the requirements specified for selector switches.
- D. Indicating Lights:
 - 1. Type: Compact, integral transformer type.
 - 2. Lamps: Six volt, long life (20,000 hours minimum).
 - 3. Common, push to test circuitry or Push–To–Test lamps shall be provided for each panel to simultaneously test all indicating lights on the panel using a single pushbutton.
- E. Button and Lens Colors:
 - 1. Green for indication of open, on, running.
 - 2. Red for indication of closed, off (ready), stopped.
 - 3. Amber for indication of equipment malfunction, process trouble and alarms (e.g., "HIGH LEVEL", "LOW LEVEL", etc.).
 - 4. Blue for indication of electrical control power on.
- F. Rotary Cam Switches:
 - 1. Provide rotary cam switches with number of positions and poles as required to perform the required signal switching function specified and shown.
 - 2. Contacts:

- a. Gold-flashed contacts housed in mechanical contact blocks with number and arrangement of contacts as required to perform intended functions.
 - b. Contact Rating: Compatible with AC or DC through-put current of signals and devices simultaneously operated by the switch contacts, but not less than 20 A at 600 VAC or 250 VDC continuous.
- 3. Switch Operator: Standard black knob.
- G. Products and Manufacturers: Provide one of the following:
 - 1. Cutler-Hammer, Type E30.
 - 2. Allen Bradley, Series 800H.
 - 3. Or approved equal.
- H. Operator-Indicator Units:
 - 1. All operators and indicators shall conform to the following:
 - a. Type: CMC units as manufactured by Micro Switch.
 - b. Rating: Oil-tight, heavy duty.
 - c. Indication: Maximum four quadrant displays with individual lamp.
 - d. Lamp Voltage: Six volts.
 - e. Color: Black bezel and knob.
 - 2. Indicator Light Modules:
 - a. Use: Equipment status (e.g., "ON/OFF", "OPEN/CLOSED").
 - b. Color Coding and Legends:

<u>Quadrant</u>	<u>Color</u>	<u>Legend</u>
A	GREEN	Off; Closed; No-Flow
B	RED	On; Open; flow
C&D	White	(Equipment Name)

- 3. "Three Position" Selector Switch Modules:
 - a. Use: For manual or automatic operation of equipment. (e.g., pumps, gates).
 - b. Type: Three-position maintained contact type.

c. Color Coding and Legends:

<u>Quadrant</u>	<u>Color</u>	<u>Legend</u>
A	RED	Hand; Open
B	GREEN	Off; Closed
C	Green	Auto
D	White	(Equipment Name)

- i. Red or green quadrant lights shall be energized depending on selected position of the switch. White quadrant light shall be energized continuously.

- d. "Two Position" Selector Switch:
e. Use: To select equipment mode (e.g., winter/summer; pumps 1/2)
f. Type: Two-position maintained contact type.
g. Color Coding and Legends:

<u>Quadrant</u>	<u>Color</u>	<u>Legend</u>
A	Blue	(Mode)
B	Green	(Mode)
C & D	White	(Function)

- i. Blue or green quadrant light shall be energized depending on selected position of the switch. White quadrant light shall be energized continuously.

4. "Alarm Acknowledge" Pushbutton:

- a. Use: To silence audible device associated with annunciator.
b. Type: Momentary pushbutton action.
c. Color Coding and Legends:

<u>Quadrant</u>	<u>Color</u>	<u>Legend</u>
A & B	Amber	Alarm

C & D	Amber	Acknowledge
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d. Lights: None.

5. "Annunciator Test" Pushbutton:

- a. Use: To functionally test the annunciator regarding lights and audible device.
- b. Type: Momentary pushbutton action.
- c. Color Coding and Legends:

<u>Quadrant</u>	<u>Color</u>	<u>Legend</u>
A & B	Amber	Annunciator
C & D	Amber	Test

d. Lights: None.

2.04 DIGITAL INDICATOR

A. General: The digital indicator shall accept an analog input and convert it to scaled numerical characters for digital display and also provide up to two alarm outputs.

B. Required Features:

- 1. Display Height: 0.56-inch.
- 2. Display Capacity: Four digits with decimal point position jumper selectable.
- 3. Display Type: Seven segment, red LED.
- 4. Accuracy: ± 0.05 percent.
- 5. Analog Input: 4 to 20 mADC.
- 6. Excitation Output: 15 VDC for powering transmitter.
- 7. Analog Output: Proportional 4 to 20 mADC.
- 8. Alarm Output: Dual with two 2 A relays.
- 9. Temperature Range: 0°C to 60°C.

10. Power: 120 VAC, + 10 to -15 percent, five watts.
 11. Enclosure: NEMA 4 splash proof.
- C. Products and Manufacturers: Provide one of the following:
1. Newport Electronics, Model Q9000E.
 2. Precision Digital, Model PD690.
 3. Or approved equal.

2.05 ANALOG INDICATOR

- A. General: Indicator Unit shall be a signal monitoring instrument that provides continuous monitoring of a process variable on a scaled vertical bar display. Indicator shall match in appearance other panel mounted instruments.
- B. Description: Indicator Unit shall display one process variable.
- C. Required Features:
1. 1. 250 ohm range resistor).
 2. Power Required: 21 to 28 VDC; nominal input current at 24 VDC is 400 mA.
 3. Displays: One segmented gas-discharge or LED vertical bar display.
 4. Display Accuracy: One percent of input span.
 5. Scale Length: Approximately 3-inches.
 6. Operating Influences:
 - a. Ambient Temperature: Maintains display accuracy ratings for temperature change within normal operating conditions.
 - b. Supply Voltage: Maintains display accuracy ratings for supply voltage variation between 21 and 28 VDC.
 - c. Electromagnetic Interference (EMI): Maintains display accuracy ratings when instrument is subjected to an electromagnetic field of up to ten volts/meter (when rack-mounted in cabinet with door closed). Display station must be installed in panel.
 7. Operating Conditions:
 - a. Ambient Temperature: 41 to 122°F (5 to 50°C).

- b. Maximum Temperature Variation: 36°F per hr (20°C per hr).
 - c. Ambient Relative Humidity: Ten to 90 percent non-condensing.
- 8. Mounting: Display station installs in a nominal 1-inch by 6-inch panel cutout and shall match in appearance other panel mounted instruments.
- D. Products and Manufacturers: Provide one of the following:
 - 1. OTEK Corporation, Model HI-QSLIM.
 - 2. Ametek/Dixson, Model BE051.
 - 3. Or approved equal.

2.06 CYCLE TIMER

- A. Type: Adjustable, microprocessor-based multipurpose timer/counter.
- B. Construction Features:
 - 1. Switch selectable ranges as follows:
 - a. 0 to 0.99 seconds.
 - b. 0 to 99.9 seconds.
 - c. 0 to 999 seconds.
 - d. 0 to 9.99 minutes.
 - e. 0 to 99.9 minutes.
 - f. 0 to 999 minutes.
 - g. 0 to 99.9 hours.
 - h. 0 to 999 hours.
 - 2. Repeat Accuracy:
 - a. Timer: ± 10 ms on all ranges.
 - b. Counter: 100 percent on all ranges.
 - 3. Memory: Non-volatile memory that will retain entire program and present time/count periods at loss of power; programmable for both reset and non-reset power fail operation.
 - 4. Operating Temperature: 32 to 140°F.
 - 5. Cycle Progress Display: Three-digit display, programmable to run up to or down from the setpoint and to stop or continue up from zero after time-out/count-out.

6. Time/Count Periods: Three programmable presets; pulse, early and main.
7. Load Relays:
 - a. Type: DPDT.
 - b. Number: One early and one delayed.
 - c. Contact Ratings: Seven amps at 120 VAC.
8. Terminals: Screw terminals accessible at rear.
9. Housing: Fully gasketed, dust and watertight.
10. Power Input: 120 VAC.

C. Products and Manufacturers: Provide one of the following:

1. Automatic Timing and Controls Company, Model 365M.
2. Or approved equal.

2.07 ELECTRONIC TOTALIZER AND INTEGRATOR

A. General:

1. Electronic integrator shall be a solid-state device to totalize a linear flow signal with respect to time. The integrated output shall be indicated on a front counter, calibrated to read directly in units of flow and shall be mounted on the panel face.

B. Required Features:

1. Modular plug-in design.
2. Variable dropout adjustment shall be provided to prevent erroneous counting at low flow rates.
3. Input Signal: 4 to 20 mADC.
4. Power Requirements: 120 VAC $\pm$ 10 percent, 60 Hz.
5. Accuracy: 0.5 percent of rate between 10 and 100 percent of full scale.
6. Slide-out chassis.

7. Suitable for flush panel mounting.
8. Unit shall match in appearance other panel mounted instruments.
9. Integrator Output Display:
 - a. Integrally mounted six or eight-digit LCD.
 - b. Non-reset.
 - c. Battery backed to prevent loss of display in the event of power outages.
10. Enclosure: NEMA 4X.
11. Ambient Operating Temperature: 0°C to 55°C.
12. Ambient Operating Humidity: 0 to 85 percent non-condensing.

C. Products and Manufacturers: Provide one of the following:

1. Precision Digital, Model PD692.
2. Or approved equal.

2.08 ELAPSED TIME METER (HOUR METER)

- A. General: Unit shall be a powered, non-resettable time indicator, with easy to read analog figures.
- B. Required Features:
 1. Power: 120 VAC, or 4 to 40 VDC.
 2. Accuracy: Within one percent.
 3. Capacity: Up to 99,999.9 hours (automatic recycle at zero); one-tenth hour resolution.
 4. Operating Temperature: -40°C to +68°C.
 5. Sealed against dirt and moisture.
 6. Tamperproof.
 7. Shock resistant.

8. Panel mountable.
 9. Nameplate below display shall read "TOTAL HOURS".
- C. Products and Manufacturers: Provide one of the following:
1. Dynapar/Veeder-Root, 7795 Series.
 2. Cutler-Hammer, E42DIR Series.
 3. Or approved equal.

2.09 CONTROL RELAY

- A. Type: General purpose, plug-in type rated for continuous duty.
- B. Construction Features:
1. Coil Voltages: 24 VDC or 120 VAC, as required.
 2. Contacts:
 - a. Silver cadmium oxide rated not less than 5 A resistive at 120 VAC or 24 VDC continuous.
 - b. For switching low energy circuits (less than 200 mA) fine silver, gold flashed contacts rated not less than 3 A resistive at 120 VAC or 28 VDC continuous shall be provided.
 3. Relays to have clear plastic dust cover.
 4. Relays to have pilot light to show energized coil.
 5. Relays to be UL recognized.
- C. Products and Manufacturers: Provide one of the following:
1. Omron

2.10 TIME DELAY RELAY

- A. Type: Dial adjustable, plug-in type time delay relay providing delay-on-make, delay-on-break or interval operation.
- B. Construction Features:
1. MOS digital circuit with transformer coupled power.

2. Switch selectable ranges as follows:
 - a. One second.
 - b. Ten seconds.
 - c. One minute.
 - d. Ten minutes.
 - e. One hour.
 - f. Ten hours.
3. Minimum Setting: Three percent of range, except 50 ms for one-second range.
4. Setting Knob Accuracy: Ten percent.
5. Contacts:
 - a. Type: DPDT.
 - b. Rating: 5 A resistive at 120 VAC, 5 A at 24 VDC.
6. Housing: Plug-in design with dust and moisture resistant molded plastic case.
7. Power Input: 120 VAC or 24 VDC as required.
8. Operating Temperature: 0°C to 55°C.
9. Unit shall have LED to show timing status.
10. Relays to be UL recognized.

C. Products and Manufacturers: Provide one of the following:

1. Automatic Timing and Controls Company, Series 328D.
2. IDEC, Series GE1A.
3. Or approved equal.

2.11 CURRENT ALARM RELAY

- A. Type: Direct current, electronic setpoint control relay which accepts 4 to 20 mADC input signal and provides dry circuit contact output based on trip point setting.
- B. Performance Requirements:

1. Repeatability: Trip point repeats within ± 0.2 percent of span.
 2. Trip Adjustment: 0 to 100 percent of span.
 3. 3. Adjustable Deadband: 1 to 15 percent of span.
- C. Construction Features:
1. Trip Adjustment: Multi-turn front panel adjustment.
 2. Contacts: DPDT relays, rated 5 A at 120 VAC or 24 VDC non-inductive.
 3. Enclosure: Standard housing designed for internal panel mounting.
 4. Power Supply: 120 VAC, 60 Hz or 24 VDC, as required.
- D. Products and Manufacturers: Provide one of the following:
1. Ronan, X54 Series.
 2. Action Pak, Model AP 1080.
 3. Or approved equal.

2.12 CURRENT ISOLATOR

- A. General: The isolating unit shall be a two wire, loop-powered device. It shall accept a 4 to 20 mADC input signal and deliver a 4 to 20 mADC output.
- B. Required Features:
1. Repeatability: $\pm$ One percent of span.
 2. Ambient Temperature Range: 0°C to 50°C.
 3. Ambient Humidity Range: 0 to 95 percent, non-condensing.
 4. Accuracy: 0.5 percent.
 5. Linearity: ± 0.1 percent of full scale.
 6. Provide one spare isolator.
- C. Products and Manufacturers: Provide one of the following:
1. Ronan, X57 Series.

2. Action Instruments, G408 Series.
3. Crompton Instruments, 250 Series.
4. Or approved equal.

2.13 ADDER

- A. General: Computing element shall add the signals as shown. Provide in sufficient quantities to accommodate all signals.
- B. Required Features:
 1. Input/output bias adjustments.
 2. Process current inputs and outputs (4 to 20 mA DC).
 3. Input/output isolation.
 4. 120 VAC or 24 VDC power, as required.
 5. Linearity: ± 0.1 percent of span.
 6. Response Time: Less than 750 ms (10 to 90 percent)
 7. Operating Temperature Range: 0°C to 55°C.
 8. Controls: Multi-turn potentiometers for output zero and input span scale factor.
- C. Products and Manufacturers: Provide one of the following:
 1. Action instruments, Model AP4402.
 2. Pribusin Inc., Model IUC-XX-ADD.
 3. Or approved equal.

2.14 MULTIPLIER/DIVIDER

- A. General: Computing element shall multiply or divide the signals shown. Provide sufficient quantities to accommodate all signals.
- B. Required Features:
 1. Input/output bias adjustments.

2. Process current inputs and outputs (4 to 20 mADC).
 3. Input/output isolation.
 4. 24 VDC power.
 5. Linearity: ± 0.15 percent of span.
 6. Operating Temperature: 0°C to 55°C.
- C. Products and Manufacturers: Provide one of the following:
1. Action Instruments, Model Q498.
 2. Or approved equal.

2.15 ELECTRONIC SQUARE ROOT EXTRACTOR

- A. General: Electronic square root extractor shall provide a current signal output that is the square root of the input signal.
- B. Required Features:
1. Input Signal: 4 to 20 mADC.
 2. Output Signal: 4 to 20 mADC.
 3. Adjustable Zero Dropout.
 4. Accuracy: 0.25 percent of span.
 5. Response Time: 70 ms.
 6. Operating Temperature: -10°C to 60°C.
- C. Products and Manufacturers: Provide one of the following:
1. API, Model 4440G.
 2. Or approved equal.

2.16 CURRENT AND VOLTAGE TRANSDUCER

- A. General: Transducer shall convert a sinusoidal alternating current or voltage into a DC current output, proportional to the RMS value of input.

B. Required Features:

1. Inputs: 50/60 Hz.
 - a. Current: 1A or 5A current transformer secondaries.
 - b. Voltage: 50 to 480 VAC.
2. Output: 4 to 20 mA DC into 0 to 500 Ohms.
3. Zero adjustment: $\pm$ Two percent minimum.
4. Span adjustment: $\pm$ Ten percent minimum.
5. Accuracy: $\pm$ 0.5 percent.
6. Response time: $\leq$ 400 ms. to 99 percent rated output.
7. Operating Temperature: 0°C to 50°C.
8. Operating Humidity: 0 to 95 percent non-condensing
9. Output Protection: Fully protected against open or short circuit outputs.
10. Overload Capacity: Two times rated current of 1.25 times rated voltage on a continuous basis.
11. Surge Withstand: Conform to ANSI C37-90a.

C. Products and Manufacturers: Provide one of the following:

1. Crompton Instruments, 250 Series.
2. Ametek, Exceltronic II Series.
3. Or approved equal.

2.17 WATT TRANSDUCER

- A. General: Measure active power, in both balanced and unbalanced, single or 3 phase systems.
- B. Required Features:
1. Frequency: 60 Hz.

2. Voltage: 50 to 480 volts with ± 20 percent range and 2 va maximum burden.
3. Current: 1A or 5A current transformer secondaries with 0 to 125 percent range and 1 va maximum border.
4. Output: 4 to 20 mADC in 0 to 500 ohms.
5. Supply: 120 VAC.
6. Accuracy: 0.5 percent.
7. Response Time: Less than 400 msec up 99 percent rated output.
8. Output Protection: Fully protected against open or short-circuited output.

C. Products and Manufacturers: Provide one of the following:

1. Crompton Instruments, 250 Series.
2. Or approved equal.

2.18 MANUAL LOADING STATION

A. General: Manual-loading station (signal generator) shall be fully suitable for flush panel mounting.

B. Features:

1. Outputs: Two independent 4 to 20 mADC.
2. Horizontal or vertical indicator length (reading station output): 1-1/2-inches minimum.
3. Graduations of Indicator: 0 to 100 percent.
4. Output Adjustment: Front panel pushbuttons.
5. Supply Voltage: 120 VAC or 24 VDC, as required.
6. Accuracy: ± 0.2 percent of span.
7. Load Resistance: 0 to 750 ohms.
8. Sampling Rate: 50 ms.

9. Operating Temperature: 4°C to 52°C.
10. Operating Humidity: 10 to 90 percent non-condensing.
11. Overall Length of Unit: Shall not exceed 15-inches in length.
12. Station case shall be constructed of steel and the chassis shall be constructed of non-corrosive metallic material. Bezel shall be finished in a gray enamel finish.

C. Products and Manufacturers: Provide one of the following:

1. ABB, Model 53ML5100.
2. Or approved equal.

2.19 OPERATOR INTERFACE (OIT)

A. General: 10" Color Touchscreen Operator Interface

1. POWER: +24 VDC $\pm$ 20%
2. 10-Inch SVGA Color High-Resolution Touchscreen HMI (800 x 600)
3. Ethernet Ports: One 10/100 Base-TX
4. Serial Ports: Two RS-232 and One RS-422/485
5. One USB Type B Port
6. NEMA Rating: NEMA 4X
7. Panel Mounting
8. SD Card Memory
9. Operating Temperature: -20°C to 60°C (-4°F to 140°F)

B. Manufacturer:

1. Not Required

2.20 ETHERNET/ NETWORK SWITCH

A. General: Furnish and install fiber-optic modular, managed Ethernet switches for connecting devices on the network. The use of hubs will not be permitted.

B. Features:

1. 10/100/1000 base-T, auto-negotiation 802.3u.
2. Minimum of eight (8) RJ-45 ports. Ethernet ports shall be expanded as needed to interconnect all system components and shall support 10gb.
3. Minimum of two (2) fiber optic ports for one (1) fiber pair. Fiber optic ports shall be expanded as needed to interconnect all system components.
4. Supports the use of IGMP for multicast traffic.
5. Supports VLAN as defined in IEEE802.1Q.
6. Supports the use of SNMP management.
7. LED for indicating port status.
8. Internal Panel mounting kit.
9. Failsafe output relay to indicate malfunction with unit.
10. FCC Part 15, Class A compliant
11. Provide management software for multilevel security, web based configuration and remote monitoring.
12. Powered by circuit on Uninterruptible Power Supply.

C. Product and manufacturer:

1. N-TRON

2.21 FIBER-TO-COPPER MEDIA CONVERTERS

- A. Fiber optic converters shall convert Ethernet TCP/IP network data to a format suitable for transmission over multi-mode fiber optic cable.
- B. Features: Converters shall provide:
1. Full-duplex 100M/1000Gbps Ethernet operation.
 2. Single mode fiber optic media support.
 3. Remote and local interface status.

- C. Provide suitable transformers to convert 120VAC power to appropriate voltage necessary to provide power to Transceivers.
- D. For control panel mounting, converter shall be DIN-rail mountable.
- E. Product and manufacturer:
 - 1. N-TRON

2.22 FIBER OPTIC PATCH PANELS (FOPP)

- A. General: Fiber optic patch panels shall be furnished as required to house fiber optic cable terminations and any other data highway attached equipment.
- B. The cabinets shall meet the following requirements:
 - 1. The termination cabinet shall be the rack mounted type, having provisions for terminating multiple fiber optic cables. Splice trays, strain relief cable attachment points, fiber organizers and bend radius hardware shall be furnished with each termination cabinet.
 - 2. Patch Panel size shall be suited to the number of fibers to be terminated within the cabinet. Bayonet/flanged couplings shall be furnished and mounted for each fiber to be terminated.
 - 3. Fiber terminations shall be spliced to pigtail cables using ST connectors (unless indicated otherwise). The pigtails shall be terminated in an orderly method.
 - 4. All fibers shall have connectors installed and terminated on patch panels.

2.23 AUTODIALER

- A. Wireless real-time
 - 1. Cellular Communication
 - 2. Software for remote PC running Windows.
 - 3. Managed Service
 - 4. 120VAC with backup battery power
 - 5. Provide one (1) year monitoring service with Mission Communications.
 - 6. Manufacturer

- a. Not Required

2.24 STRIP CHART RECORDERS

A. Standard Specifications

1. Compact recorder with a recording width of 100mm
2. Flush Panel Mounting (vertical), mounting next to each other (horizontal and vertical)
3. Recording Period: dot matrix model, continuous for each channel.
4. Chart Speed: 1 to 1500mm/h (1mm step)
5. Periodic printout contents: Date (mm/dd/yy), time(hh:mm), measurement data of each channel , scale printout, recording color, chart speed.
6. Colors: ch1=purple, ch2=red, ch3=green, ch4=blue, ch5=brown, ch6=black (color can be assigned to any channel)

B. Manufacturer:

1. Not Required

2.25 SPARE PARTS AND TEST EQUIPMENT

A. CONTRACTOR shall furnish and deliver the spare parts and test equipment as outlined below, all of which shall be identical and interchangeable with similar parts furnished under this Section.

B. The spare parts shall be packed in containers suitable for long term storage, bearing labels clearly designating the contents and the pieces of equipment for which they are intended.

C. The following shall constitute the minimum spare parts:

1. Five of each type of input-output relay for each 40 or less furnished for this Contract.
2. One replacement power supply for each type and size furnished for this Contract.
3. A one-year supply of all expendable materials.

4. One per ten (two, if fewer than twenty) of each type of panel mounted instrument including lights, and pushbuttons.
 5. One dozen of each type and size of fuse used in panels and instruments.
- D. The following shall constitute the minimum test and calibration equipment:
1. None
- E. All spare parts shall have been operated and tested in the factory as part of factory testing prior to shipment of the control system.
- F. For analog instruments, the supplier shall submit a separate quotation for a recommended list of spare-parts and test equipment. Each item recommended shall be listed and priced separately. The spare parts quotation shall contain a statement that the prices quoted are firm for a period of one year (with escalators for the next two years) subsequent to the OWNER'S acceptance of the equipment, and that the supplier understands that the OWNER reserves the right to purchase none, any, or all of the parts quoted. The supplier is required to show that a stock of spare-parts and test equipment is obtainable within a 48-hour period.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install each item in accordance with manufacturers' recommendations and in accordance with the Contract Documents.
- B. All items shall be mounted and anchored in compliance with Section 13090, Process Control Panels and Enclosures.

END OF SECTION

**SECTION 13090
PROCESS CONTROL PANELS AND HARDWARE**

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope:

1. CONTRACTOR, PICS SUPPLIER shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish, install, calibrate, test, start-up and place into satisfactory operation all process control panels and enclosures for their respective equipment.

Designation	NAMA Rating	Enclosure Material	Mounting
PLC-E1	12	Painted Steel	Free Standing

1.02 QUALITY ASSURANCE

A. Standards, Codes and Regulations:

1. Construction of panels and the installation and interconnection of all equipment and devices mounted within shall comply with applicable provisions of the following standards, codes and regulations:
 - a. National Fire Protection Association 79, Annex "D" Standards, (NFPA).
 - b. National Electrical Code, (NEC).
 - c. National Electrical Manufacturer's Association Standards, (NEMA).
 - d. American Society for Testing and Materials, (ASTM).
 - e. Operational Safety and Health Administration Regulations, (OSHA).
 - f. Underwriters' Laboratory, Inc., (UL).
 - g. State and Local code requirements.
 - h. Where any conflict arises between codes or standards, the more stringent requirement shall apply.
2. All materials and equipment shall be new and all panels shall be built in an Underwriters' Laboratory, Inc. (UL) approved panel shop and bear the UL label.

- B. General Design Requirements:
 - 1. Comply with the requirements of Section 13600, Process Control System General Provisions.
 - 2. Comply with the control descriptions of Section 13030, Software Control Block Descriptions.
- C. Factory Assembly and Testing:
 - 1. Comply with the requirements of Section 13500, Process Control System Factory Testing.

1.03 SUBMITTALS

- A. Comply with the requirements of Section 13600, Process Control System General Provisions.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements of Section 13600, Process Control System General Provisions.

PART 2 - PRODUCTS

2.01 GENERAL CONSTRUCTION REQUIREMENTS

- A. Provide all electrical and/or pneumatic components and devices, support hardware, fasteners, interconnecting wiring and/or piping required to make the control panels and/or enclosures complete and operational.
- B. Panels and Enclosures shall be UL 508A and devices therein shall be UL508 listed.
- C. Locate and install all devices and components so that connections can be easily made and that there is ample room for servicing each item.
- D. Components for installation on panel exterior shall be located generally as shown. Layouts shall be submitted for review in accordance with Section 13600, Process Control System General Provisions.
- E. Where permitted by location and layout as shown, panels and enclosures shall have full height rear access doors. Where rear doors are not possible, panels shall have full or half height front access doors.

- F. Adequately support and restrain all devices and components mounted on or within the panel to prevent any movement.
- G. Provide sub-panels for installation of all relays and other internally mounted components.
- H. All wiring to panel connections from field instruments, devices, and other panels shall be terminated at master numbered terminal strips, unless otherwise specified.
- I. Provide copper grounding studs for all panel equipment.
- J. Provide the following convenience accessories inside of each control panel:
 - 1. One 120 VAC, 20A duplex, grounding type receptacle.
 - 2. One or more 120 VAC fluorescent light fixtures with 40 watt lamp and protective plastic shield to span across the width of the panel but not less than two-thirds the width of the panel, as a minimum.
 - 3. One 120 VAC, 20A, snap switch, to turn on the light, mounted in an outlet box with a cover and located so that it is easily accessible from access door.
 - 4. Service light with switch and duplex receptacle shall have its own circuit breaker and separate power feed.
- K. The bottom 12-inches of free standing panels shall be free of all devices, including terminal strips, to provide ease of installation and testing.
- L. No device shall be mounted less than 36-inches above the operating floor level, unless otherwise specified.

2.02 IDENTIFICATION

- A. Provide laminated plastic nameplates for identification of panels and components mounted thereon as follows:
 - 1. Nameplates shall be of 3/32-inch thick laminated phenolic type with white matte finish surface and black letter engraving.
 - 2. Panel identification nameplates to have 1/2-inch high letter engravings.
 - 3. Panel mounted component (e.g., control devices, indicating lights, selector switches, etc.) identification nameplates to have 1/4-inch high letter engravings.

4. Nameplates shall be attached to the panel face with two stainless steel self-tapping screws.
 5. Nameplate engravings shall include the instrument or equipment tag number and descriptive title as shown and specified.
- B. Tag all internally mounted instruments in accordance with the following requirements:
1. Tag numbers shall be as listed in the Instrument Index.
 2. The identifying tag number shall be permanently etched or embossed onto a stainless steel tag which shall be fastened to the device housing with stainless steel rivets or self tapping screws of appropriate size.
 3. Where neither of the above fastenings can be accomplished, tags shall be permanently attached to the device by a circlet of 1/16-inch diameter stainless steel wire rope.
 4. Identification tag shall be installed so that the numbers are easily visible to service personnel.
 5. Front of panel mounted instruments shall have the tag attached to rear of device.
- C. Tagging of the following items shall be accomplished with the use of adhesive plastic Brady USA, Inc. labels, or equal.
1. Tag all electrical devices (e.g., relays, timers, power supplies) mounted within control panels and enclosures.
 2. Tag all pneumatic lines.
 3. Numerically tag all terminal blocks.
 4. Color code and numerically tag wiring at each end.

2.03 PANELS AND ENCLOSURES

- A. General:
1. Panels and enclosures shall meet the NEMA requirements for the type specified.
 2. Sizes shown are estimates. CONTRACTOR shall furnish panels and enclosures amply sized to house all equipment, instruments, front panel

mounted devices, power supplies, power distribution panels, wiring, tubing and other components installed within, as required.

B. Construction Features:

1. Control panels located inside environmentally controlled (conditioned spaces) room areas shall be NEMA 12 rated.
 - a. Fabricate enclosures using minimum 14-gage steel for wall or frame mounted enclosures and minimum 12-gage for free standing enclosures. Steel shall be free of pitting and surface blemishes.
 - b. Continuously weld all exterior seams and grind smooth. Also, surface grind complete removal of corrosion, burrs, sharp edges and mill scale.
 - c. Reinforce sheet steel with steel angles where necessary to adequately support equipment and ensure rigidity and to preclude resonant vibrations.
 - d. Panel shall be flat within 1/16-inch over a 24-inch by 24-inch area, or flat within 1/8-inch for a larger surface. Flatness shall be checked by using a 72-inch long straight edge. Out-of-flatness shall be gradual, in one direction only, and shall not consist of obvious depressions or a series of wavy sections.
 - e. Use pan type construction for doors. Door widths shall not exceed 36-inches.
 - f. Mount doors with full-length heavy-duty piano hinge with stainless steel hinge pins.
 - g. Provide oil resistant gasket completely around each door or opening.
 - h. Provide handle-operated, oil-tight, key-lockable three-point stainless steel latching system with rollers on latch-rods for easy door closing.
 - i. Use stainless steel fasteners throughout.
 - j. Provide interior mounting panels and shelves constructed of minimum 12-gage steel with a white enamel finish.
 - k. Provide steel print pocket with white enamel finish.
 - l. Provide enclosure mounting supports as required for floor, frame, or wall mounting.
 - m. Provide all holes and cutouts for installation of conduit and equipment. Cable and piping to enter the enclosure through the bottom, unless otherwise noted. All conduit and piping openings and all conduits entering cabinet shall be sealed watertight.
 - n. Completely clean all interior and exterior surfaces so they are free of corrosive residue, oil, grease and dirt. Zinc phosphatize for corrosion protection.
 - o. One coat of primer shall be applied to all interior and exterior surfaces immediately after corrosion protection has been applied.

- Exterior surfaces shall then be given sufficient coats of primer surfacer, applied with sanding and cleaning between coats, until a Grade 1 finish can be produced on the finish coat.
- p. All interior surfaces shall be painted with two coats of semi-gloss white polyurethane enamel.
 - q. Provide interior back panel for mounting of panel components and for easy removal of component system. Panel to be steel, powder coated black.
 - r. All exterior surfaces shall be painted with a minimum of three finish coats of polyurethane enamel to ultimately produce a Grade 1 finish (super smooth; completely free of imperfections). Color to be selected by ENGINEER from complete selection of standard and custom color charts furnished by the manufacturer. Provide one extra quart of touch-up paint for each exterior finish color.
 - s. Primer and finish paint shall be compatible and shall be a low VOC, high solids polyurethane enamel, Hi-Solids Polyurethane B65 W300 Series as manufactured by Sherwin-Williams, Inc. or equal. Provide one extra quart of Primer and finish paint.
2. Control panels located in field (outdoor and/or in non-conditioned spaces) shall be NEMA 4X rated.
- a. Panels shall be Type 316L stainless steel construction with a minimum thickness of 12-gage for all surfaces (except those areas requiring reinforcement) having a smooth brushed finish.
 - b. Provide handle-operated, oil-tight, key-lockable three-point stainless steel latching system with rollers on latch-rods for easy door closing.
 - c. Rolled lip around three sides of door and along top of enclosure opening.
 - d. Hasp and staple for padlocking.
 - e. Provide a, gasketed lockable hinged door to encompass all non-NEMA 4 front of panel instruments.
 - f. Provide 3-inch high channel base assembly, with solid bottom, drilled to mate the panel to its floor pad.
 - g. Floor Pad: Refer to Part 3 of this Section.
 - h. Provide interior back panel for mounting of panel components and for easy removal of component system. Panel to be steel, powder coated black.
3. Where the application applies and with the approval of ENGINEER, wall mounted enclosures may be provided. The enclosure shall comply with Paragraph B.1., B.2. or B.3., except for the following:
- a. Locations shall be as shown on or as specified under other Sections.

- b. Doors shall be full height.
 - c. Corrosion resistant polyester quick release latches shall be provided.
 - d. No extra holes or knockouts shall be provided. No light or convenience outlet need be provided.
4. For panels located outdoors, provide sunshields and white epoxy coating on panel exterior, this includes stainless steel. Coordinate proper etching primer for epoxy adhesion. Refer to Instrumentation details shown on the drawings for additional requirements.

C. Electrical Systems:

1. Control of Environment:

a. Outdoor Panels (or Panels located in non-conditioned spaces):

- i. Provide adequately sized automatically controlled 120 VAC strip heaters to maintain temperature inside each enclosure above 40°F to maximum of 95°F when the outside temperature is -20°F through 40° F.
- ii. Provide automatically controlled ventilation fans to maintain temperature inside each enclosure below the maximum operating temperature rating of the components inside the enclosure. Housing shall be constructed of 316 SS materials.
- iii. Provide thermostats to automatically control heating and cooling requirements without need of manual operation of a heating/cooling transfer switch.
- iv. Provide documentation if any of the above is deemed unnecessary.

b. Indoor Panels (or Panels located in Conditioned spaces):

- i. Provide adequately sized, automatically controlled 120 VAC strip heaters to maintain temperature 10°F above ambient for condensation prevention inside panels.
- ii. Provide documentation if any of the above is deemed unnecessary.

2. Power Source and Internal Power Distribution:

- a. General: Control panel power supply source, type, voltage, number of circuits and circuit ratings shall be as shown.
- b. Panels shall be provided with an internal 120 VAC power distribution panel with number of circuits and separate circuit breakers sized as required to distribute power to the panel

components. Distribution panel shall contain two spare breakers, minimum.

3. Wiring:

- a. Internal wiring shall be Type MTW and THW, Tinned stranded copper wire with thermoplastic insulation rated for 600 V at 90°C for single conductors, color coded and labeled with wire identification.
- b. For DC panel signal wiring - copper, use No. 16 minimum AWG shielded.
- c. For DC power wiring, use No. 16 minimum AWG. For AC signal and control wiring, use No. 16 minimum AWG. For wiring carrying more than 15 A, use sizes required by NEC standards.
- d. Separate and shield low voltage signal wiring from power and control wiring by a minimum of 6-inches.
- e. Group or bundle parallel runs of wire using covered troughs. Maximum bundle size to be 1-inch. Troughs shall have 40 percent spare capacity.
- f. Install wire troughs along horizontal or vertical routes to present a neat appearance. Angled runs are not acceptable.
- g. Adequately support and restrain all wiring runs to prevent sagging or other movement.
- h. Terminate all field wiring (no more than one wire per termination) using screw/clamp type terminals, insulated, crimp-on connectors (soldered type not acceptable) at 600 V rated barrier type terminal strips and permanently affixed numeric identifiers beside each connection. Identifiers to be self-stick plastic tape strips with permanent type, machine printed numbers. For DC field signal wiring, terminal strips shall be capable of handling No. 12 wiring (minimum). Provide Phoenix Contact, Entrelec or Allen Bradley.
- i. All wiring shall be installed such that if wires are removed from any one device, power will not be disrupted to any other device.
- j. All alarms generated external to the panel, spare alarm, and repeat contacts shall be wired out to terminal blocks.
- k. For internal component-to-component wiring only, compression type terminal blocks are acceptable.
- l. Provide spare terminals equal in number to 20 percent of the terminals used for each type of wiring (e.g., DC signal and AC power).
- m. Provide a separate terminal for grounding each shielded cable.
- n. Use separate 5/16-inch diameter copper grounding studs for instrument signal cable shields and AC power.
- o. Where wires pass through panel walls, provide suitable bushings to prevent cutting or abrading of insulation.

- p. When DC power and/or low voltage AC power is required, provide and install the necessary power supplies and transformers in the panel.
 - q. Provide circuit breakers to protect each circuit, with no more than one instruments on a single circuit.
 - r. Provide complete wiring diagram showing "as-built" circuitry. Diagram shall be enclosed in transparent plastic and placed in easily accessible pocket built into panel door.
4. Surge Protection:
- a. General: Surge protection shall be provided to protect the electronic instrumentation system from surges propagating along the signal and power supply lines.
 - b. Products and Manufacturers: Provide one of the following:
 - i. Phoenix Contact
 - ii. Dehl
 - iii. Edco
 - iv. No approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install equipment in conformance with NEC.
- B. Unless otherwise noted, install indoor NEMA 12 panels on 4-inch concrete pad. Extend pad 4-inches beyond outside dimensions of base, all sides. Lay grout after panel sills have been securely fastened down.
- C. Unless otherwise noted, install outdoor NEMA 4X panels on a reinforced concrete pedestal:
 - 1. Minimum Thickness: Eight-inches with No. 4 steel reinforcing bars at 12-inches on centers, each way.
 - 2. Minimum Size: Twelve-inches larger than outer dimensions of base, all sides.
 - 3. Provide excavation and backfill work in conformance with Section 31 24 00, Earthwork for Structures.
 - 4. Provide concrete work in conformance with Section 03 30 00, Cast-In-Place Concrete.

- D. Install and interconnect all equipment, devices, electrical hardware, instrumentation and controls and process controller components into and out of and among the enclosures as indicated on the Drawings.

3.02 TESTING AND ADJUSTMENTS

- A. Perform system testing and make any adjustments necessary in accordance with this Section, Section 13600, Process Control System General Provisions, Section 13500, Process Control System Factory Testing, and Section 13400, Process Control System Start-up and Field Testing.
- B. Perform power supply, voltage adjustments to tolerances required by the appurtenant equipment.

3.03 SPARE PARTS AND TEST EQUIPMENT

- A. CONTRACTOR shall furnish and deliver the spare parts and test equipment as outlined below, all of which shall be identical and interchangeable with similar parts furnished under this Section.
- B. The spare parts shall be packed in containers suitable for long-term storage, bearing labels clearly designating the contents and the pieces of equipment for which they are intended.
- C. The following shall constitute the minimum spare parts:
 - 1. Five of each type of input-output relay for each 40 or less furnished for this Contract.
 - 2. One replacement power supply for each type and size furnished for this Contract.
 - 3. A one-year supply of all expendable materials.
 - 4. One per ten (two, if fewer than twenty) of each type of panel mounted instrument including lights, pushbuttons.
 - 5. One dozen of each type and size of fuse used in panels and instruments.

END OF SECTION

SECTION 13100
PROGRAMMABLE LOGIC CONTROLLERS

PART 1 - GENERAL

1.01 SCOPE

- A. This section covers programmable logic controllers of remote terminal units (RTUs/PLCs), including associated input/output hardware to control process equipment and serve as the interface to field devices. The CONTRACTOR through the use of a qualified PICS Supplier shall furnish, install, modify, configure and commission the Process Instrumentation and Control System (PICS).
 - 1. Control System. The Instrumentation and Control System section shall apply to all equipment furnished or modified under this section. Additional PLC software requirements are indicated in Software Control Block Descriptions section.
 - 2. PICS Supplier shall be responsible for supplying the RTUs/PLCs in the following panels:
 - a. PLC-E1

1.02 GENERAL

- A. Equipment furnished and installed under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by ENGINEER.
 - 1. General Equipment Stipulations: The General Equipment Stipulations shall apply to all equipment and materials furnished under this section. If requirements in this specification differ from those in the General Equipment Stipulations, the requirements specified herein shall take precedence.
 - 2. Drawings: Supplementing this section, the drawings indicate the number and sizes of RTUs/PLCs, locations of RTUs/PLCs, and provide diagrams and schematics regarding connection and interaction with other equipment. All hardware, including power supplies, special cables, and other appurtenant equipment, shall be provided to meet the functional requirements described herein and indicated on the drawings.
 - 3. I/O List: An input/output (I/O) field device signal listing is included as an appendix attached to this section.

1.03 SUBMITTALS

- A. Submittals shall be as specified in the Instrumentation and Control System section

1.04 DELIVERY, STORAGE, AND SHIPPING

- A. Delivery, storage and shipping shall be as specified in the Instrumentation and Control System Section.

1.05 SPARE PARTS

- A. Spare parts shall be furnished as follows:

<u>Spare Part</u>	<u>Quantity</u>
1. Processor modules:	10%, Minimum 1 of each type used
2. Power supply modules:	10%, Minimum 1 of each type used
3. I/O modules:	10%, Minimum 1 of each type used
4. Communications modules:	10%, Minimum 1 of each type used
5. SPD units:	20%, Minimum 3 of each type used

1.06 I/O POINT LIST DESCRIPTION

- A. The I/O point list contains the information necessary to configure the RTU/PLC I/O interface hardware and to indicate range conversion or signal functions.
- B. "P&ID TAG" is an alphanumeric character string. For example, the point HCP-FI-813-0123-A, the following apply:
 - 1. The three letter character string (HCP) identifies the Control Panel. Refer to SCADA network diagram for control panel identifiers.
 - 2. The next alpha character is the functional identifier and follows ANSI/ISA-S5.1. In the example, the "F" represents flow.
 - 3. The next alpha character (I) is the function identifier. In the example, the "I" represents an analog input.
 - 4. The three-digit number (813) identifies the P&ID number.
 - 5. The four-digit number (0123) identifies the loop or field device.
 - 6. The final character (A) is used, as required, as a suffix to differentiate multiple points in the same loop.
- C. "DESCRIPTION" is an alphanumeric character string that describes the I/O point. Points described as "SPARE" denote pre-wired I/O.

- D. "SIGNAL TYPE" is one of the following:
1. AI designates an analog input.
 2. DI designates a discrete input.
 3. AO designates an analog output.
 4. DO designates a momentary, maintained or latched discrete output.
 5. DNT designates DeviceNet communication.
 6. I/P designates Ethernet Industrial protocol
- E. "RANGE/ SETPOINT" is a numeric value denoting the minimum and maximum signal value of the controlled variable. Information in this column is provided only for analog points. For all instrumentation, RANGE information is provided.
- F. "UNITS/ N.C. Status" denotes the unit type as it applies to the RANGE. Where-ever applicable N.C Status defines the normal control status.
- G. "POWER FROM" indicates where power for the instrument/device producing the signal originates from.
- H. "SIGNAL FROM DEVICE" indicates the instrument/device which produces the signal.
- I. "SIGNAL FROM TB" is the terminal block number where the signal wire is terminated. Information in this column shall be provided by CONTRACTOR.
- J. "SIGNAL FROM TERMINAL #" is the terminal number where the signal wire is terminated. Information in this column shall be provided by CONTRACTOR.
- K. "SIGNAL FROM TERMINAL #" is the terminal number where the signal wire is terminated. Information in this column shall be provided by CONTRACTOR.
- L. "SIGNAL TO DEVICE" indicates the instrument/device which receives the signal.
- M. "SIGNAL TO TB." is the terminal block number where the signal wire is terminated. Information in this column shall be provided by CONTRACTOR.
- N. "SIGNAL TO TERMINAL #" is the terminal number where the signal wire is terminated. Information in this column shall be provided by CONTRACTOR.
- O. "SIGNAL TO TERMINAL #" is the terminal number where the signal wire is terminated. Information in this column shall be provided by CONTRACTOR.
- P. "RTU/PLC ADDRESS" indicates the device/channel number of the point. Information in this column shall be provided by CONTRACTOR.
- Q. "Comments/ Notes" indicates comments or notes if there are any.

1.07 WARRANTY

- A. General Warranty: The special warranties specified in this Article shall not deprive OWNER of other rights or remedies OWNER may otherwise have under the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by CONTRACTOR under the Contract Documents.
- B. Special Warranties:
 - 1. Furnish manufacturer's written two-year warranty from date of substantial completion against failure or faulty workmanship of the RTU/PLC. Services during the warranty period shall include repair or replacement, and all costs related to visits to site, as necessary to remedy defects.

PART 2 - PRODUCTS

2.01 PROCESS AUTOMATION CONTROLLER (PAC) – RTU/PLC

- A. Hardware
 - 1. Major hardware components of the PAC portion of the control system shall include:
 - a. Power Supply and Chassis
 - b. Central Processing Unit (CPU)
 - c. Input/Output Modules
 - d. Programming Software
 - e. Communications Equipment
 - 2. General
 - a. The PACs shall provide a control layer between the PC based operator workstations and field mounted transducers, switches, controllers, and process actuators. The PAC shall be an intelligent, programmable, microprocessor-based device that can collect and store data, process and time stamp alarms, provide analog and discrete process control functions and communicate to PC based workstations. The PACs shall support 10/100 Mbps Ethernet 802.3/u compliant data highways and RS 232/485 serial communication communicate between the PACs, third party devices and PC workstations.
 - b. All components of the PAC system shall be manufactured to normally recognized industry standards for temperature, electrical interference, vibration, etc. and regularly sold for industrial installations.

- c. The PAC system shall be of modular design with a plug-in central processing unit, power supply and input/output modules. All components shall be marketed and supported by the one manufacturer.
- d. Where main power is available, a single external 120/240 VAC to 12/24 VDC main power supply shall have the capability of supplying power to the internal power supply/sequencer, CPU and local input/output modules. The system power supplies shall be fused for overload protection.
- e. Where main power is unavailable, the PAC shall be capable of being powered by a solar array, regulator and battery bank in lieu of a 120/240 VAC to 24 VDC main power supply. The RTU/PLC shall be designed for low power consumption in order to minimize the size of the backup batteries and solar equipment. The CPU, power supply and backplane alone shall draw no more than 1.5W.
- f. The PAC shall be an intelligent, programmable controller capable of stand-alone control operation in the event of failure of the communication link to the operator workstations. During a communication failure, it shall continue to store time-stamped alarm and historical data in non-volatile memory for access upon restoration of the communication network.
- g. All products shall be designed, manufactured, and tested in accordance with recognized industrial standards. The RTU/PLC shall adhere to the following environmental specifications:
 - (1) UL, CUL, CSA or FM, Class 1, Div.2, Groups A – D approval for operation in hazardous locations
 - (2) Vibration: 1.0G, 10-150 \Hz, 0.5 g over 150-1000 Hz. The system is to be operational during and after testing.
 - (3) Temperature. All RTU/PLC hardware shall operate at an ambient temperature of -40 to 70 degrees C (-40 to +158

degrees F), with an ambient temperature rating for storage of - 40 to + 85 degrees C (- 40 to + 185 degrees F).

(4) Relative Humidity. The Programmable Controller hardware shall function continuously in the relative humidity range of 5% to 95% non-condensing.

(5) Noise Immunity. The Programmable Controller system shall be designed and tested to operate in the high electrical noise environment of an industrial plant as governed by the following regulations: EEE 472, IEC 801, and ANSI/IEEE C-37.90A-1978

h. The supplier shall provide operating instruction manuals with adequate information pertaining to the following:

(1) System specifications

(2) Electrical power requirements

(3) Grounding procedures

(4) Assembly, and installation and wiring procedures

(5) Power up and shut down procedures

(6) Diagnostic and troubleshooting procedures

(7) Programming procedures

(8) Warranty and repair procedures

(9) Recommended spare parts list

- i. The supplier shall have the capability to provide product application assistance by trained and experienced engineers to assist the owner with program and system development through telephone consultation and on-site check-out, debug, and start-up assistance.
- j. The supplier shall have the capability to conduct on-site training programs at a location provided by the customer.
- k. The supplier shall supply Internet based technical support and FAQs on their web site.
- l. Modules are defined herein as devices that plug into a chassis and are keyed to allow installation in only one direction. The PAC program must continue to run even without physical I/O modules installed in the chassis.
- m. All system modules, main and expansion chassis shall be designed to provide free airflow convection cooling. No internal fans or other means of cooling, except heat sinks, shall be permitted.
- n. The manufacturer shall have a fully operational quality assurance and quality control program in place and shall comply with ISO9001:2000 standards for "Quality Systems- Model for Quality Assurance in design/Development, Production, Installation, and Servicing".
- o. All major assemblies and sub-assemblies, circuit boards, and devices shall be identified using permanent labels or markings, each of which indicates the manufacturers catalog number and a product manufacturing date code.
- p. The PACs shall be one of the following:
 - i. Rockwell Automation

3. Power Supply and Chassis

a. Chassis

- (1) The I/O chassis shall provide for directly mounting the CPU, power supplies, communication modules, and the I/O modules. Chassis shall be available in sizes to house two, four, eight, and up to fourteen I/O local modules. Both panel and DIN-rail mounting shall be available as standard offering.

b. Internal Power Supply

- (1) The internal power supply/sequencer (DC to DC converter) shall operate on 11 to 30V dc to power the CPU, communication cards, and I/O modules.
- (2) Power supply health and voltage output levels shall be monitored by the CPU.
- (3) At the time of power-up, the power supply/sequencer shall inhibit operation of the processor and I/O modules until the DC voltages are within specifications.
- (4) The internal power supply shall not consume an available I/O slot.
- (5) The measurement of the voltage supplied to the power supply module shall be available as a floating-point value to the internal software for monitoring and / or trending purposes. The use of an external converter and an analog input is not acceptable.

4. Central Processing Unit (CPU)

a. General

- (1)The CPU shall be a plug-in module providing program execution, system timing, local and remote I/O access, alarming, data storage, and communication handling. The CPU shall be a 32-bit microprocessor. It shall execute application programs conforming to the IEC 61131-3 standard and use a real-time multitasking operating system.
- (2)The CPU shall be a single printed circuit board utilizing surface mount technology. The CPU shall be available with options for processor speed and memory organization. In addition, the CPU shall be available with or without Ethernet to meet suitability for low power installations.
- (3)The CPU shall be supplied with a battery-backed time of day clock and calendar.
- (4)A three-position mechanical keylock switch, with removable key, shall be provided. RUN mode will prevent any on-line modification to the application control program. REMOTE mode will allow on-line modification via the network connection only. LOCAL mode will allow modification via network and via a locally connected PC.
- (5)The CPU family shall allow for user program transportability from one CPU model to another.
- (6)The CPU shall not consume an available I/O slot.

b. Capacity

- (1) The CPU shall be capable of controlling both local I/O in the chassis and remote I/O in one or more distributed expansion chassis'
- (2) The processing of a typical logic program consisting of a mix of analog and digital commands shall not exceed 2 milliseconds for

1024 instructions. I/O devices located in the same backplane as the CPU should be scanned in less than 0.5 milliseconds.

c. Diagnostics

(1) The CPU shall perform on-line diagnostics that monitor the internal operation of the PAC. If a failure is detected, the CPU shall initiate error messages and initiate a system shutdown if a fatal failure occurs. The following at a minimum shall be monitored:

- a. Memory Failure shall cause a Watchdog to occur.
- b. Memory battery low shall generate an operator message.
- c. CPU general fault shall suspend processor operation.
- d. Communications port failure shall generate an operator message.
- e. Scan time over run shall generate an operator message.
- f. I/O failure shall generate an operator message.
- g. Analog I/O over/under range shall generate an operator message.
- h. The system shall be completely tested upon power-up and any failures shall be posted to a local display.

(2) All on-line diagnostic information shall be stored and made available to the communication system as alarm conditions with the date and time of occurrence of the fault.

- (3) All on-line diagnostic information shall be accessible to the PAC application program.
- (4) The CPU shall have LED indicators to show status such as PAC GOOD, PROGRAM IDLE TIME, and Power OK/FAIL. If any of the above conditions fault, the CPU shall visually display an internal PAC diagnostic fail alarm and present a diagnostic display on the CPU LED's.

d. Programming Environment

- (1) The CPU shall be capable of being programmed by an external MS Windows PC via a serial communication port on the PAC and remotely via the Ethernet communication interface.
- (2) The programming PC shall have access to the application program, the system configuration, all registers, I/O, system fault status, I/O override, and system diagnostics.
- (3) Application programs and modifications may be downloaded into the CPU flash memory, while the CPU is running the current application program from RAM memory with minimal impact on the scan time. The newly downloaded program can then be quickly activated to RAM for execution.
- (4) The CPU shall support all five-industry standard IEC 61131-3 programming languages. As a minimum, Function Block Diagram, Ladder Diagram, Structured Text, Instruction List, and Sequential Function Chart (SFC) programming shall be provided.
- (5) The CPU shall be able to be programmed and monitored over the Ethernet and serial communication networks ports via a laptop (PC).

- (6) The programming software shall support the use of Ladder Diagram and Function Block Diagram in the same program and the same worksheet.
- (7) The software shall make use of precompiled firmware libraries as well as user defined function blocks and user defined function libraries. User defined libraries shall be easily ported from one project to another without the use of “Cut and Paste”.

e. Memory

- (1) The CPU shall contain the several memory types suitable to the data being stored.
 - a. 16 MB non-volatile Flash memory shall be used to store the application program code, historical data archive and audit files. In addition, any other files such as as-built drawings, maintenance logs, instructions and graphic files may be transferred to the flash memory via FTP (File Transfer Protocol). In addition, the entire program source including all graphics shall be stored in a single zipped file in the flash memory. It shall be possible to upload this entire program into the original program source for editing.
 - b. Retained values, unreported alarms and data shall be stored in 1 MB battery backed Static RAM. The RAM memory battery backup system shall be capable of retaining all memory for a minimum of three (3) months under load.
 - c. 4 MB of high-speed dynamic RAM shall be used for the actual program execution and temporary data values. In low power applications without Dynamic RAM, 2 MB Static RAM shall be used for program execution.
- (2) Internal detection of low memory backup battery condition shall be indicated on a Diagnostic LED for local indication and also a low battery alarm variable shall be provided to alert an operator at the PC workstations.
- (3) The program memory shall be sized as required to implement the functions specified plus a minimum of 10% spare. Scratch

pad or "housekeeping" programs shall not be counted in memory size rating.

- (4) The PAC CPU memory addresses shall be automatically configured when configuring the I/O points using 'Tag Names'. Tag names of at least 32 characters shall be allowed. The engineer shall not be required to assign memory addresses to the individual points.

f. Archiving

- (1) The PAC shall have the ability to perform automated archiving of historical data to nonvolatile Flash RAM or battery backed RAM.
- (2) Each row of archive data will be time stamped and contain a sequence number.
- (3) Each column of data shall be able to be independently configured to use one of the following functions:
 - a. Weighted average
 - b. Time Based average
 - c. Average of the square root of the archived point
 - d. Square of the average of the square root of the archived point
 - e. Snapshot
 - f. Minimum value observed during the period
 - g. Maximum value observed during the period
 - h. Capture a totalized value and reset it to 0
 - i. Total of the archived point over the period

g. Event Audit Logging

- (1) The PAC shall be able to monitor both analog and digital values and log any change to these values to an Alarm and Event Audit trail for auditing purposes.

Each record in the log shall contain:

- a. The date and time that the change was made
 - b. The variable or tag name of the changed data point
 - c. The old value
 - d. The new value
- (2) The PAC shall be able to log alarm occurrences to the Audit trail log. Each record in the log shall contain:
- a. The time and date of the alarm
 - b. The variable or tag name of the changed data point
 - c. The priority of the alarm (Critical, Non-Critical, Guide, Event)
 - d. The type of alarm (High, Low, High High, Low Low, Return to Normal)
 - e. The alarm limit
 - f. The value that triggered the alarm
- (3) A minimum of 500 auditable changes and 500 Alarms shall be able to be logged.

5. Local Input/Output Modules (I/O)

a. General

- (1) The I/O count and type shall be determined, as that required to implement the functions specified plus an allowance for active spares as noted below.
- (2) Each I/O drop or I/O location shall include 20 percent active input points (both DI and AI) and 20 percent active outputs points (both DO and AO) for future use. The spares shall be the

same types of I/O modules supplied. Spare output points that require the use of an external relay shall be supplied with the external relay.

- (3) The I/O modules shall be available with both local and remote terminations. Local terminations allow field wiring directly to the I/O module with up to 14-gauge wire. Remote, DIN rail mounted, termination modules connect to I/O module cards in the PAC chassis via pre-assembled mass terminated cables.
- (4) Field wiring terminal blocks shall be pull-apart type, if mounted on the I/O modules to allow I/O module replacement without disconnection of the field wiring. All field wiring terminal blocks shall be 300V minimum NEMA rated and accommodate no less than #14 gauge wire.
- (5) Surge protection on all modules shall meet C37.90-1978 and IEC 801-5 standards.
- (6) I/O module usage shall comply with the following table unless noted otherwise:

<u>I/O Type</u>	<u>Channel/Module</u>	<u>Module Type</u>
Analog input	6	1-5 Vdc or 4-20mA (externally sourced)
Analog input	8	4-20mA (internally sourced)
Analog output	4	4-20mA (externally sourced)
Discrete input	16	Internally sourced dry contact
Discrete input	8	120/240 VAC and 24 VDC (externally sourced)
Discrete output	8	120/240 VAC and 24 VDC open drain

		(externally sourced)
Counter input	4	24 VDC (externally sourced) (0-10 KHz)
Counter input	4	Internally sourced (0-10 KHz)
Thermocouple	6	B, R, S, J, E, K, T, C, N, +/- 10 mV
RTD	4	2, 3 or 4 wire 100 ohm Platinum

b. Discrete I/O

- (1) Open-source outputs shall be solid state MOSFET with an operating voltage range of 10 – 31 Vdc with a capability of sinking up to 500 mA.
- (2) Remote terminated Relay type outputs shall be Form-C type (both NO and NC contact) and shall be rated for 5.0 amps continuous. These type outputs shall be used on all MCC circuits or other inductive loads. Local direct wire to I/O module outputs shall be solid state relay rated 6A at 120/240 VAC.
- (3) Each discrete input and output shall have an LED or other visible indication of on/off status.
- (4) Discrete input and output modules shall be available with optional 500 V to the chassis and 1500 V optical isolation to field devices.

c. Analog I/O

- (1) All of the analog inputs shall have at least 14 bit resolution and all analog outputs shall have at least 12 bit resolution. Analog input and output system accuracy shall be within .1% of full scale at 25° C and .3% of full scale

from –40° to +70°

- (2) Analog input and output modules shall be available with optional 500 V isolation to chassis.

B. Software

1. Operating System

- a. The PAC shall use a real-time, pre-emptive multitasking operating system allowing program execution to be scheduled and prioritized. The application program shall run from compiled code for fast execution.
- b. The operating system shall reside in the PAC itself. It is not acceptable to transfer data to a PC containing the operating system.

2. PAC Programming Software

- a. The supplier shall provide all PAC configuration software packages complete with documentation, disks, licenses, and copy protection devices to allow application development.
- b. The software package shall allow off-line program development and on-line editing, annotation, monitoring, debugging, uploading, and downloading of programs to the PACs via RS-232-C, RS-485 and Ethernet data highway.
- c. All required hardware (including cables, cable adapters, etc.) to allow the PAC's connection to a Standard RS-232-C, RS-485 and Ethernet data highway personal computer port shall be furnished.
- d. The software package shall include a software license agreement allowing the Owner the right to utilize the software as required for any current or future modification, documentation, or development of the PAC's furnished for this project.

e. The software shall be capable of the following IEC 61131-3 functions:

- (1) Function Block Diagram
- (2) Sequential Function Chart
- (3) Instruction List
- (4) Structured Text
- (5) Ladder Diagram

f. The system shall have the capability to create and reuse User Defined Function Blocks containing one or more functions or function blocks. These User Defined Function Blocks shall be stored in a User Library that is transportable between application programs. Each User Defined Function Block shall have reassignable inputs and outputs so each instance of the function block can have different variables attached to the terminals.

g. The system software shall be Microsoft Windows-based and run in a Windows 10 environment and include a 32-bit simulator capable of executing the application program in the PC to allow the engineer to test and debug the program prior to downloading to the PAC.

h. The software shall also include a live I/O simulator which will allow the developer to test programs without the necessity of being connected to a PAC

i. The system shall provide extensive on-line program debugging tools to allow analysis and troubleshooting of the application program. Live dynamic variable values shall be displayed in the application program worksheets and languages in which they were developed. The debugging tools shall include as a minimum the following capabilities

- (1) Variables Cross Reference containing all variables, Function Blocks, Actions, Transitions and connections used in the program.
- (2) A graphical Logic Analyzer to record and trend variable values over a certain time interval.

- (3) A Watch Window to display variable values of interest, from different worksheets, in a single window.
 - (4) Breakpoint, Step and Single Cycle program execution to step and trace execution.
 - (5) Built-in Data Line Monitor for serial communication message monitoring and debugging.
 - j. The software shall include a security feature to prevent unauthorized personnel from modifying and downloading the program to a PAC. The security shall consist of an ID and Password sign-on to access on-line functions.
 - k. The username and password shall be stored on the PAC itself and not in the application development software. The security features can only be adjusted by an individual who has access to an administrative level ID and password for the PAC.
 - l. The software shall have extensive on-line Windows-based help screens.
 - m. Annotation shall be possible from any Microsoft Windows application. Full text import and export of reference data shall also be possible.
 - n. The software shall support local and remote downloading of the IEC 61131-3 application and control program selectively to flash and RAM memory. In addition, the entire application source may be downloaded and stored in Flash memory for future upload to the IEC 61131-3 programming software.
3. Instruction Set
- a. The IEC 61131-3 instruction set, manufacturer libraries and functional extensions shall be pre-programmed Firmware and installed in the RTU/PLC by the manufacturer.

- (1) Firmware upgrades will be made available to authorized users on the manufacturer's web site. Firmware upgrades may be downloaded to the RTU/PLC flash memory via a locally connected PC or remotely via any wired or wireless serial or Ethernet port utilizing the manufacturer's protocol. Remote Firmware downloading shall not interrupt RTU/PLC measurement or control operations or normal data communication during the download process. A brief interruption upon completion will be acceptable to allow activation of the new Firmware.
 - (2) A communication failure during the download process must not allow corrupt Firmware to execute in the RTU/PLC. Incomplete Firmware downloads due to a communication failure will be completed when proper communication is reestablished.
- b. The CPU shall be capable of performing high-level instructions including data word functions such as:
- (1) Four-Function Math: The CPU shall be capable of performing addition, subtraction, multiplication, and division on integer and floating-point numbers.
 - (2) Compare Function: The CPU shall perform the compare function that compares two integers for less than, equal to, greater than, and not equal to. The programmed function shall energize when true and de-energize when false.
 - (3) Move Function: The CPU shall be able to move a bit, byte, word, double word, integer, and floating-point value from one memory location to another memory location.
- c. The PAC CPU shall perform all the functions of the conventional three-mode (PID) analog controller. The CPU shall be able to process up to 64 PID loops. The number of PID loops shall be limited only by the installed physical hardware and shall not be constrained by software limits. Each PID loop shall incorporate an anti-windup algorithm.

- c. The system shall have the capability to address software timers and software counters in any combination and quantity up to the limit of available memory.
- d. The PAC shall be capable of executing nested conditional logic including IF, THEN and ELSE, which will allow the programmer to control program execution.
- e. It shall be a function of the CPU to convert between all data types. For example, the CPU shall allow conversion between Integer, Real, String, BCD and Boolean.
- f. The system shall have the capability to enter comments in any free workspace area of Ladder Diagram, Function Block and Sequential Function Chart diagrams.
- g. The system shall have a means to program a fault recovery routine. When a major system fault occurs in the system, the fault recovery routine shall be executed, and the system shall determine if the fault has been eliminated. If the fault is eliminated, program execution resumes. If the fault still exists, the system will shut down. A user shall have the option to either resume operation or to shut down upon fault detection.
- h. Multiple cyclic interrupt routines having assignable interrupt priority shall be programmable such that the routine shall be executed regularly. The interval at which the routine is executed shall be user-specified in the range of 1 to 65,535 milliseconds.
- i. Supported trigonometric instructions must include Sine, Cosine, Tangent, Inverse Sine, Inverse Cosine, and Inverse Tangent. These instructions must fully support floating-point math and be accessible in ladder and other programming languages.
- j. Additional floating-point instructions must support Natural Log and Exponential.

- k. It shall be possible to complete complex, combined calculations in a single instructions or equations of the format $((A+((B-C)*D))/E)$.
- l. Variable operation functions shall include Average, Square Root, Integration, Differentiation, Totalize, and lead/lag.
- m. Variable selection functions shall include a Comparator to select an output based on comparison of two analog inputs and Multiplexor to select from a group of inputs.

C. Communications

1. Communication Ports and Remote I/O Communications

- a. The CPU shall support up to three built-in serial communication ports for programming, operator interface peer-to-peer communications and remote I/O operations. The serial ports shall support data rates up to 115.2 K baud.
- b. The CPU shall have two optional 10/100 MHz Ethernet port for peer-to-peer, operator interface and remote I/O. The connections shall be standard 10/100Base-T, RJ45 connections. The Ethernet ports shall provide independent Ethernet networks with routing capability.
- c. A dedicated port shall be available to connect to the manufacturers Local Operator Display. This display shall not require the use of any of the available programming or network serial communication ports.
- d. Serial ports expansion shall by available providing at least two additional built-in RS 232 and two additional RS 485 ports. In addition to the two serial ports, communication expansion shall allow one built-in 900 MHz spread spectrum radio and one built-in V.90 dial-line modem.

- e. A 'Virtual Port' software function shall be included in the standard instruction set to redirect serial messages to an IP Ethernet port allowing serial port expansion through the use of commonly available Terminal Servers. It shall be possible to mix protocols through the virtual port to multiple serial devices connected to Terminal Servers.

2. Protocols

- (a) In addition to the PAC manufacturers own serial protocol, the PAC shall also support the following serial protocols:

- (1) Serial RTU and ASCII Modbus
- (2) Ethernet I/P
- (3) DNP3
- (4) HART protocol (via an external, field loop, HART transceiver)
- (5) DF1
- (6) Generic ASCII protocols

- b. In addition to the PAC manufacturers own IP protocol, the PAC shall also support the following IP protocols over TCP/IP or UDP/IP:

- (1) Open Modbus (Modbus over IP)
- (2) DNP3
- (3) CIP
- (4) FTP
- (5) SMTP

- c. The PAC shall support the use of serial ports as IP ports by employing the Point to Point Protocol (PPP). Access via PPP shall have the following security options:

- (1) None
- (2) Plain text Authorization (PAP)

(3) Encrypted Challenge Authorization (CHAP)

d. The Modbus protocol shall be designed to communicate with as many other Modbus capable devices as possible. The following configuration parameters shall be available:

- (1) Gould or Enron variants
- (2) Select 0 based or 1 based counting for address offset
- (3) High bit first or low bit first
- (4) High byte first or low byte first
- (5) High word first or low word first
- (6) The use of 8, 16 or 32 bit registers for Integer values
- (7) The use of two 16bit or one 32 bit registers for IEEE floating point values
- (8) The ability to adjust the register count and address range in the Modbus message for devices storing 32 bit values as:
 - (a) One 32 bit register taking up one address space and accessed by a call for one register
 - (b) Two 16 bit registers taking up two address spaces and accessed by a call for two registers
 - (c) Two 16 bit registers taking up one address space and accessed by a call for two registers
- (9) The following Modbus commands shall be able to be used by a Modbus Master Port or responded to by a Modbus Slave Port
 - (a) 1 - Read Coil Status
 - (b) 2 - Read Input Status
 - (c) 3 - Read Holding Registers
 - (d) 4 - Read Input Registers
 - (e) 5 - Force Single Coil
 - (f) 6 - Preset Single Register
 - (g) 7 - Read Exception Status
 - (h) 15 - Force Multiple Coils
 - (i) 16 - Preset Multiple Registers

- e. Each communications port can be configured, independently, for Modbus. That is, different ports could utilize completely different configurations, including different variants of Modbus and different register memory maps.
- f. The PAC protocol shall support program file downloading, on-line program editing and debug, historical file transfer, alarm message transmission and network time-syncing.
- g. The PAC protocol shall support a Report-By-Exception (RBE) polling mechanism to minimize communication overhead in low bandwidth networks. Data values will only be transmitted if they have changed beyond the specified deadband.
- h. The supplier shall provide web-based PC software for PAC configuration and data access. It shall rely on an open architecture, industry standard, .html format and be compatible with Microsoft Internet Explorer. The software shall provide access to the data via Internet, Intranet, dedicated networks and direct local connections.
 - (1) The software shall include a set of ActiveX Controls for reading and writing real-time and historical data, trending, recipe editing and custom display generation
 - (2) The custom as well as Pre-configured web interface may be stored on a PC or downloaded to the PAC flash memory. It may then be uploaded from flash memory and run on the PC.
- i. The supplier shall provide an OPC Server compliant with OPC Data Access specification 1.0a and 2.0 and the OPC Alarm and Event specifications.
 - (1) The OPC server shall provide a background polling mechanism capable of refreshing the database at a slower scheduled rate than the primary polling rate for current active display and trend data.

- (2) The OPC server shall provide tag browsing by compatible client applications.
- (3) The OPC server database shall be created automatically by reading the PAC tag file. Retyping of the PAC tags to generate the OPC server database is not acceptable.

D. I/O Expansion

1. I/O Expansion Rack

- a. I/O shall be expandable beyond the base PAC chassis by interfacing to one or more I/O Expansion chassis'. The I/O expansion chassis' shall be the same as the main PAC chassis and support all of the same I/O modules. The application control program shall run in the main PAC CPU.
- b. This main PAC CPU will interface to the I/O Expansion chassis communication module via one of the available Ethernet ports. The I/O Expansion communication processor shall not require programming or variable address mapping of I/O.

E. RTU/PLC I/O Surge Protection Devices (SPD)

- 1. Analog Signals. All analog require SPDs at both ends of the circuit. The SPD shall:
 - a. The SPD shall consist of a multistage hybrid unit that does not use metal oxide varistors (MOVs), not interfere with the normal operation of the device, and have a trip level less than the surge withstand level of the instrument.
 - b. The SPD shall be designed to withstand a 10 kA test current of a (8/20) us waveform per IEEE C62.41.-2002, category C Area.
 - c. SPDs used in Division 1 hazardous areas will conform to EN 020/DIN EN 50 020/VDE 0170/0171 part 7: 1996-04. SPDs in hazardous areas shall provide at least 500V isolation between intrinsic safety ground and earth ground.
 - d. The SPD shall have a series resistance less than 10 ohms and a maximum operating load of 250 mA.

- e. The SPD shall have an operating temperature range of -40°C to +80°C.
 - f. The SPD shall provide line-to-line and line-to-ground protection.
 - g. The SPD shall be DIN rail mountable or pipe mountable depending on the application.
 - h. No more than two analog signals per SPD will be allowed.
 - i. The SPD shall be Phoenix Contact PlugTrab PT 2x2 series or MTL SD-32 series for DIN rail mounting, and Phoenix Contact PipeTrab S-PT 1 series, or MTL TP-P pipe series for conduit installation at the instrument.
2. Digital Signals. All RTU/PLC digital input and output signals shall be protected with a Surge Protection Device (SPD) in the RTU/PLC enclosure. Relay isolated outputs do not require a SPD, but do require surge suppression across the relay coil.
- a. The SPD shall consist of a multistage hybrid unit that does not use metal oxide varistors (MOVs), not interfere with the normal operation of the device, and have a trip level less than the surge withstand level of the instrument.
 - b. The SPD shall be designed to withstand a 10 kA test current of a (8/20) us waveform per IEEE C62.41.-2002, category C Area.
 - c. SPDs used in Division 1 hazardous areas will conform to EN 020/DIN EN 50 020/VDE 0170/0171 part 7: 1996-04. SPDs in hazardous areas shall provide at least 500V isolation between intrinsic safety ground and earth ground.
 - d. The SPD shall have a series resistance less than 10 ohms and a maximum operating load of 250 mA.
 - e. The SPD shall have an operating temperature range of -40°C to +80°C.
 - f. The SPD shall provide line-to-line and line-to-ground protection.
 - g. The SPD shall be DIN rail mountable.
 - h. No more than two signals per SPD will be allowed.
 - i. The SPD shall be Phoenix Contact PlugTrab PT 2x2 series or MTL SD-32 series selected for the application and voltage range
3. Communications Signals. All copper serial communications links (RS-232, RS-485) shall be protected at both ends of the circuit, or as shown on the system block diagram
- a. The SPD shall consist of a multistage hybrid unit that does not use metal oxide varistors (MOVs), not interfere with the normal operation of the device, and have a trip level less than the surge withstand level of the instrument.
 - b. SPDs for shall be UL497B listed.

- c. SPDs used in Division 1 hazardous areas will conform to EN 020/DIN EN 50 020/VDE 0170/0171 part 7: 1996-04. SPDs in hazardous areas shall provide at least 500V isolation between intrinsic safety ground and earth ground.
- d. SPDs for data communication shall have a minimum cutoff frequency (3 dB) of 100MHz for 50 ohm systems.
- e. The SPD shall have a series resistance less than 2.2 ohms and a maximum operating load of 250 mA.
- f. The SPD shall have an operating temperature range of -40°C to +80°C.
- g. The SPD shall provide line-to-line and line-to-ground protection.
- h. The SPD shall have a peak clamping voltage of +/- 25 V dc.
- i. The SPD shall be DIN rail mountable.
- j. The SPD shall be designed to withstand a 10 kA test current of a (8/20) us waveform per IEEE C62.41.-2002, category C Area.
- b. The SPD shall be Phoenix Contact Data-PlugTrab PT PT5-HF Series, or MTL SD-32 series selected for the application and voltage range.
- c. RTU/PLC Analog I/O Signal Isolation. All RTU/PLC analog signals will be provided with 3-way signal isolating amplifiers. Signal isolation power supplies shall be separate from field digital input power supplies.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

- A. RTUs/PLCs installation requirements are specified in Div 13 sections except as described herein.
- B. Field check, testing, and training shall be as specified in the Instrumentation and Control System section.

3.02 CONFIGURATION

- A. RTU/PLC Programming and Configuration: Configuration services are as specified below and as specified in Section 13030, Software Control Block Descriptions.
- B. Programming Responsibilities: System Supplier will have all RTU/PLC and HMI programming responsibilities for the project as tabulated below. The System Supplier shall provide all programming services or any Test software required for acceptance testing.

	PROCESSOR ID	MODEL	RESPONSIBILITY
1.	PLC-E1	ControlLogix	PICS Supplier

City of Ocoee
 WWTF Electrical Upgrade and Expansion
 CPH Project No. 06023

Programmable Logic Controller

- C. Communications Configuration: The communications devices shall be fully configured and installed by System Supplier. Communications shall be configured as shown on the drawings.

3.03 I/O CONFIGURATION

- A. Implement the control system database fields in a consistent manner by using the following procedures:
 - 1. Use abbreviations and acronyms already established in the Contract Documents. In particular, use the information in the I/O Point List.
 - 2. Use only abbreviation or acronym for a word or group of words, respectively.
 - 3. Use the same subject and word order within data fields.
 - 4. Use the same term (either phrase, word or acronym) to denote the same meaning. Do not use multiple terms for a single meaning.
 - 5. Use the point names, descriptions, logic state descriptions, ranges and units of measurement exactly the same wherever the point is referenced.
 - 6. Show point names and descriptions for all point references on documentation.
 - 7. Spell correctly.
 - 8. Maintain lists of acronyms and abbreviations used.

3.04 I/O HARDWARE CONFIGURATION

- A. Partition the I/O among cards within an I/O enclosure to provide control loop integrity.
 - 1. Put all inputs of the same I/O type associated with a device (e.g. pump, blower, clarifier or other piece of equipment) on the same card.
 - 2. Put all inputs of the same I/O type for devices arranged in process trains (e.g. a pump, its inlet valve and its outlet valve, or a pump and its associated macerator) on the same card or cards if more than one card is required to accommodate the points.
 - 3. Put all outputs of the same I/O type associated with a device or group of devices in a process train on the same card or cards if more than one card is required to accommodate the points.
 - 4. Where the preceding requirements specified in this paragraph would cause more than 20 percent spare points on a card, points for a device or process train may be split between two consecutive cards.

5. Make unused terminals resulting from partitioning the I/O into pre-wired spares. Provide pre-wired spare points with all cabling and termination internal to the DCU as done for other I/O points.

3.05 POINT DATA FIELDS

- A. I/O point data fields may be subject to review and modification by the ENGINEER during the Shop Drawing review phase. Incorporate changes directed by the ENGINEER completely into the entire system, at no additional cost to OWNER, subject to the following limitations:
- B. Limit the total number of modifications to 20 percent of the total number of I/O points.
- C. Each unique change will count as one modification. For example, modifying the description, range, and engineering unit on an analog input count as three modifications.
- D. Analog input alarm limit definition will not be counted as a modification.

END OF SECTION

SECTION 13200
PROCESS CONTROL SYSTEM INPUT/OUTPUT LIST

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope:
 - 1. This Section describes the system input/output (I/O) list, which follows this Section and requirements for configuring the control system database.
- B. Related Sections:
 - 1. Section 13100, Programmable Logic Controllers.
- C. Refer to the attachment at the end of this specification for the 13200A – PLC Input/Output List.

1.02 SUBMITTALS

- A. For each I/O attribute listed in the I/O list that cannot be used exactly as listed, submit an explanation of the reason for the deviation and propose a method to modify the I/O list information. Do not proceed with any configuration until a method of resolving deviations is accepted by the ENGINEER.

1.03 I/O POINT LIST DESCRIPTION

- A. The I/O point list contains the information necessary to configure the PLC or PLC I/O interface hardware and to indicate range conversion or signal functions.
- B. "POINT NUMBER" is an alphanumeric character string. For example, the point MP-F0123I1, the following apply:
 - 1. The first two characters (MP) refers to the specific plant area (MP = Main Pump, for example).
 - 2. The third character is the functional identifier and follows ANSI/ISA-S5.1. In the example, the "F" represents flow.
 - 3. The four-digit number (0123) identifies the loop or field device.
 - 4. The next alpha character (I) is the function identifier. In the example, the "I" represents an analog input.
 - 5. The final numeric character (1) is used, as required, as a suffix to differentiate multiple points in the same loop.
- C. "DESCRIPTION" is an alphanumeric character string up to 40 positions in length. Points described as "SPARE" denote pre-wired I/O.
- D. "SIGNAL TYPE" is one of the following:
 - 1. AI designates an analog input.

2. DI designates a discrete input.
 3. PI designates a pulse input.
 4. AO designates an analog output.
 5. DO designates a momentary, maintained or latched discrete output.
- E. "DATA FIELD 1" and "DATA FIELD 2" describes the function or signal characteristics. These are further defined under each signal type.
- F. "RELAY" is used only for discrete outputs to indicate the action of the contacts:
1. "MO" designates momentary action.
 2. "MA" designates maintained action.
- G. "ALARM" is used only for discrete inputs to distinguish between status inputs and alarm inputs.
- H. "CROSS REFERENCE" is used to designate those I/O points that are transferred between the DCU and PLC via the digital communications link (PLC Gateway). Designation is made by listing "PLC" under the reference description.

1.04 SIGNAL TYPE DESCRIPTION

- A. Analog Input:
1. "DATA FIELD 1" is the electrical input signal range and units.
 2. "DATA FIELD 2" is the process parameter range and engineering unit.
- B. Discrete Input:
1. "DATA FIELD 1" is the condition that exists when a field contact is closed.
 2. "DATA FIELD 2" is the condition that exists when a field contact is open.
- C. Pulse Input:
1. "DATA FIELD 1" is the pulse frequency range.
 2. "DATA FIELD 2" is the process parameter range and engineering unit.
- D. Analog Output:
1. "DATA FIELD 1" is the electrical output signal and units.
 2. "DATA FIELD 2" is the range of the controlled variable and engineering units.
- E. Discrete Output:
1. Discrete outputs can be momentary or maintained.
 2. "DATA FIELD 1" is the contact closed function.
 3. "DATA FIELD 2" is the contact open function.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 I/O CONFIGURATION

- A. Implement the control system database fields in a consistent manner by using the following procedures:
 - 1. Use abbreviations and acronyms already established in the Contract Documents. In particular, use the information in the I/O Point List.
 - 2. Use only abbreviation or acronym for a word or group of words, respectively.
 - 3. Use the same subject and word order within data fields.
 - 4. Use the same term (either phrase, word or acronym) to denote the same meaning. Do not use multiple terms for a single meaning.
 - 5. Use the point names, descriptions, logic state descriptions, ranges and units of measurement exactly the same wherever the point is referenced.
 - 6. Show point names and descriptions for all point references on documentation.
 - 7. Spell correctly.
 - 8. Maintain lists of acronyms and abbreviations used.

3.02 I/O HARDWARE CONFIGURATION

- A. Partition the I/O among cards within an I/O enclosure to provide control loop integrity.
 - 1. Put all inputs of the same I/O type associated with a device (e.g. pump, blower, clarifier or other piece of equipment) on the same card.
 - 2. Put all inputs of the same I/O type for devices arranged in process trains (e.g. a pump, its inlet valve and its outlet valve, or a pump and its associated macerator) on the same card or cards if more than one card is required to accommodate the points.
 - 3. Put all outputs of the same I/O type associated with a device or group of devices in a process train on the same card or cards if more than one card is required to accommodate the points.
 - 4. Where the preceding requirements specified in this paragraph would cause more than 20 percent spare points on a card, points for a device or process train may be split between two consecutive cards.
 - 5. Make unused terminals resulting from partitioning the I/O into pre-wired spares. Provide pre-wired spare points with all cabling and termination internal to the DCU as done for other I/O points.

3.03 POINT DATA FIELDS

- A. I/O point data fields may be subject to review and modification by the ENGINEER during the Shop Drawing review phase. Incorporate changes directed by the ENGINEER completely into the entire system, at no additional cost to OWNER, subject to the following limitations:
1. Limit the total number of modifications to 20 percent of the total number of I/O points.
 2. Each unique change will count as one modification. For example, modifying the description, range, and engineering unit on an analog input count as three modifications.
 3. Analog input alarm limit definition will not be counted as a modification.

3.04 INPUT/OUTPUT TAGGING

- A. Each tag number shall be written as follows AA I #####Y # where:
1. AA =Area/DPU or PLC Identifier.
 2. I = ISA Identification.
 3. ##### =4 Digit Loop Number.
 4. Y = Function Identifier.
 5. # = Suffix (to distinguish between similar variables).
- B. Area/DPU/PLC/RTU Identifier:
- C. ISA Identification:
1. A =Miscellaneous Analytical.
 2. B =Burner, Combustion.
 3. C = Chlorine Residual/Gas.
 4. D = Density.
 5. E = Voltage.
 6. F = Flow.
 7. G = Intrusion.
 8. H = Hand.
 9. I = Current.
 10. J = Power.
 11. K = Time.
 12. L = Level.
 13. M = Motor.
 14. N = pH.
 15. O = Oxygen.

16. P = Pressure.
17. Q = Quantity.
18. R = Radioactivity.
19. S = Speed, Frequency.
20. T = Temperature.
21. U = Common Alarm.
22. V = Vibration.
23. W = Torque (Weight or Force).
24. X = Hazardous Gas.
25. Y = Event, State or Presence (Switch Position).
26. Z = Position, Dimension.

D. Function Identifier:

1. A = Available / In Auto (input)
2. B = Backward Rotation (input)
3. C = Full Closed (input)
4. D = Full Open (input)
5. E = Close/Energize (output)
6. H = High (input)
7. I = Input (Analog)
8. L = Low (input)
9. N = Open (output) or Control Mode (input)
10. O = Output (Analog)
11. R = Running (input)
12. S = Start (output)
13. T = Stop (output)
14. U = Malfunction (input)
15. V = Slow (output)
16. W = Slow (input)
17. X = Selector Switch (input)

E. Examples:

1. MPZ0120N=Main Pump Building, Valve 0120 Position, Open Command.
2. IAT0128I = Incinerator A, Temperature Transmitter 0128, Analog Input Value.

3. STL0333L = Settled Wastewater Building, Level Switch 0333, Low Alarm (Discrete Input).

END OF SECTION

SECTION 13300
PLANT MONITORING AND CONTROL SYSTEM TRAINING

PART 1 - GENERAL

1.01 REQUIREMENTS AND RESPONSIBILITIES

- A. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to perform and coordinate all required training at times acceptable to OWNER and ENGINEER.
- B. CONTRACTOR shall retain the services of the Process Instrumentation and Control System (PICS) Supplier to provide operational and maintenance training for all process, monitoring and control equipment as specified herein.
- C. The PICS SUPPLIER shall provide for on-site training by an authorized representative of the equipment manufacturer as part of the Supplier's services. The manufacturer's representative shall be fully knowledgeable in the operation and maintenance of the equipment.
- D. CONTRACTOR, PICS SUPPLIER shall be responsible for all costs, including cost of travel, meals and lodging, for their respective equipment, if required, that is associated with training, and shall provide all required materials, texts and required supplies. A maximum of eight (8) people will be attending training courses.
- E. All training shall be conducted in the normal eight-hour working days until conclusion of the training course. For on-site training, the course instructor shall be assigned full time and shall not perform other duties throughout the period of the course.
- F. Training shall occur after all other process related training in completed. The Contractor shall coordinate the training sequences.

1.02 SUBMITTALS

- A. Within 60 days of the effective date of the Notice to Proceed, CONTRACTOR, PICS SUPPLIER shall submit their plan for training and also conforming to the requirements of Instruction of Operations and Maintenance Personnel. Included in the plan shall be course outlines and schedules for training to be provided on-site.

1.03 GENERAL TRAINING

- A. General:
 - 1. Respective contractors or suppliers shall provide supplier or manufacturer approved representative's who shall perform standardized, structured training courses at a training facility in Columbia County staffed with regular full time training instructors covering both operation and maintenance of the system equipment furnished by the Supplier or Manufacturer.
 - 2. OWNER will send the following personnel to attend training courses at the project site.

- a. Operations Training: 4 persons.
 - b. Maintenance Training: 4 persons.
- B. Operator Training Course:
 - 1. Provide a minimum of three (3), days, eight hours per day, course covering the structure and the functions of the PLC's, SCADA equipment and other system components and devices. The course shall familiarize the student with the procedures for applying the system to process control problems and develop student programming capability.
 - 2. As a minimum, the course shall cover the following topics:
 - a. Overview of systems functional capabilities.
 - b. Equipment overview including system component functions, operating principals and proper use.
 - c. Loading and start-up of the digital system hardware components.
 - d. Use of system commands.
 - e. Development of programs and control schemes.
 - f. Development and use of system displays.
 - g. Programming concepts and techniques.
 - h. Use of bulk storage device for system backup.
- C. Maintenance Training Course:
 - 1. Provide a minimum of three (3) days, eight hours per day, course covering preventive and troubleshooting maintenance for the system components. The course shall familiarize the student with diagnostic capabilities of the system, both software and hardware, and also the routine maintenance procedures on the system and the common peripheral devices.
 - 2. As a minimum the course shall cover the following topics:
 - a. System overview description including the power subsystems and logic components of the processor bus.
 - b. Description of the maintenance and troubleshooting aids of the system including software diagnostic programs.
 - c. Description of all bus operations.
 - d. Description of peripheral and process interface devices.

1.04 SPECIFIC TRAINING

- A. Onsite training to begin after startup and demonstration testing process is completed.
 - 1. Primary Sensors/Transducers and Field Instruments:
 - a. The services of equipment manufacturer's representatives shall be provided for a minimum of two (2) hours for each type of instrument including analytical equipment.
 - b. Provide on-site operation and maintenance training by Supplier and the equipment manufacturer representatives after the completion of the Startup process, conforming to the

- requirements of Instruction of Operations and Maintenance Personnel.
- c. Training shall accomplish the following:
 - i. Provide instruction covering use and operation of the equipment to perform the intended functions.
 - ii. Provide instruction covering procedures for routine, preventive and troubleshooting maintenance including equipment calibration.
 - iii. Explain procedures for placing the equipment in and out of operation and explain necessary actions and precautions to be taken regarding the overall plant monitoring and control system.
2. Training covering the control equipment:
- a. The PICS Supplier shall provide minimum of two (2) days of additional operations training covering all system components.
 - b. Training course shall accomplish the following:
 - i. Provide all instructions necessary to operate and utilize all system components.
 - ii. Provide all instruction necessary to monitor and control the system processes from the designated control panel.
 - iii. Explain procedures for control of the system during scheduled or rescheduled shutdown and the subsequent start-up.
 - iv. Provide instructions for regular caretaking operations.
3. PLC & SCADA Training:
- a. The PICS Supplier shall provide minimum of one (1) day - eight hours, of additional operations training covering all PLC system components.
 - b. The PICS Supplier shall provide training that covers PLC's, SCADA system equipment and the components of the network as follows:
 - i. Provide an overview of system hardware and software.
 - ii. It shall train people in configuration, operation and programming processors.
 - iii. The emphasis shall be placed on how to perform set point changes, minor programming changes, range changes, diagnostics and upkeep of documentation.
 - iv. Instruction for hardware and software maintenance, trouble shooting and maintenance planning.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 13400
PROCESS CONTROL SYSTEM START-UP AND FIELD TESTING

PART 1 - GENERAL

1.01 SYSTEM CHECK-OUT AND START-UP RESPONSIBILITIES

- A. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install all equipment and coordinate all activities necessary to perform check-out and start-up of the equipment.
- B. CONTRACTOR shall retain the services of the Process Instrumentation and Control System (PICS) Supplier to supervise and/or perform check-out and start-up of all system components. As part of these services, the PICS Supplier shall include for those equipment items not manufactured by him; the services of an authorized manufacturers' representative to check the equipment installation and place the equipment in operation. The manufacturers' representative shall be thoroughly knowledgeable about the installation, operation and maintenance of the equipment.

1.02 CHECKOUT AND START-UP

- A. CONTRACTOR, under the supervision of the PICS Supplier, and other instrument suppliers as applicable, shall perform the following:
 - 1. Check and approve the installation of all components and all cable and wiring connections between the various system components prior to placing the various processes and equipment into operation.
 - 2. Conduct a complete system checkout and adjustment, including calibration of all instruments, tuning of control loops, checking operation functions, and testing of final control actions. When there are future operational functions included in this work, they should be included in the system checkout. All problems encountered shall be promptly corrected to prevent any delays in start-up of the various unit processes.
- B. Both CONTRACTOR and PICS SUPPLIER shall provide all test equipment necessary to perform the testing during system checkout and start-up.
- C. CONTRACTOR and PICS SUPPLIER shall be responsible for the initial operation of monitoring and control system and shall make any required changes, adjustment or replacements for operation, monitoring and control of the various processes and equipment necessary to perform the functions intended.
- D. CONTRACTOR shall furnish to the ENGINEER certified calibration reports for field instruments and devices specified in Section 13080, Primary Sensors and Field Instruments, and panel mounted devices specified in Section 13070, Panel-Mounted Instruments and Devices, as soon as calibration is completed.

- E. CONTRACTOR shall furnish ENGINEER an installation inspection report certifying that all equipment has been installed correctly and is operating properly. The report shall be signed by authorized representatives of CONTRACTOR, and PICS SUPPLIER.
- F. CONTRACTOR and PICS SUPPLIER shall perform all calibrations with the Owner present. No exceptions.

1.03 INTEGRATED SYSTEM FIELD TEST

- A. Following the PICS checkout and initial operation, CONTRACTOR, under the supervision of the PICS SUPPLIER, shall perform a complete system test to verify that all equipment and programmed software is operating properly as a fully integrated system, and that the intended monitoring and control functions are fully implemented and operational. Any defects or problems found during the test shall be corrected by CONTRACTOR and then retested to demonstrate proper operation.
- B. Following demonstration of all system functions, the PICS including field sensors/transducers and instruments shall be running and fully operational for a continuous 48 hour period. The Operational Availability Demonstration specified below shall not begin until the continuous 48 hour integrated system test has been successfully completed and OWNER and ENGINEER agree that the Operation Availability Demonstration can begin.

1.04 OPERATIONAL AVAILABILITY DEMONSTRATION

- A. Operational Availability Demonstration (OAD) shall begin following completion of the integrated system field test as specified above and shall continue until a time frame has been achieved wherein the system (both hardware and software) availability meets or exceeds 99.7 percent for seven (7) consecutive days and no system failures have occurred which result in starting the OAD over again. During the OAD the system shall be available to plant operating personnel for use in normal operation of the plant.
- B. For the purpose of the OAD, the system will be defined as consisting of the following systems and components:
 - 1. Plant Control Panel, PCP all remote displays all PLC panels as shown on SCADA Network drawing, provided by the PICS SUPPLIER, and CONTRACTOR.
 - 2. Generator & Switchgear Control Panel and all Standby Generator panels as shown on SCADA Network drawing, provided by the Equipment Supplier.
 - 3. Main Plant SCADA HMI software and SCADA control system changes
- C. The conditions listed below shall constitute system failures which are considered critical to the operability and maintainability of the system. The OAD shall be terminated if one or more of these conditions occur. Following correction of the problem, a new seven (7) consecutive day OAD shall begin.
 - 1. Failure to repair a hardware or software problem within 120 consecutive hours from the time of notification of a system failure.

2. Recurrent hardware or software problems: if the same type of problem occurs three times or more.
 3. Software problem causing a processor to halt execution.
- D. The following conditions shall constitute a system failure in determining the system availability based on the equation specified in Paragraph 1.4.E., below:
1. Failure of PLC's.
 2. Loss of communications between devices on the communications network.
 3. Failure of one or more input/output components.
 4. Failures of any type affecting ten or more input/output points simultaneously.
 5. Failure of any type affecting one or more regulatory control loops or sequential control strategies thereby causing a loss of the automatic control of the process variable or process sequence operation.
 6. Failure of power supply. Where redundant power supplies are provided, failure of one power supply shall not constitute a system failure provided the backup power supply operates properly and maintains supply power. Failure of the backup supply to operate properly and maintain supply power shall constitute a system failure.
 7. Failure of three or more primary sensors/transducers or field instruments simultaneously.

- E. The system availability shall be calculated based on the following equation:

$$A = \frac{TTO}{TTO + TTR} \times 100 \text{ percent}$$

where, A = system availability in percent

TTO = total time in operation
TTR = total time to repair

- F. Time to repair shall be the period between the time that CONTRACTOR is notified of a system failure and the time that the system has been restored to proper operation in terms of hours with an allowance for the following dead times which shall not be counted as part of the time to repair period.
1. Actual travel time for service personnel to get to the Site up to six hours per incident from the time CONTRACTOR is notified of a system failure.

2. Time for receipt of spare parts to the plant site once requested up to 24 hours per incident. No work shall be done on the system while waiting for delivery of spare parts.
 3. Dead time shall not be counted as part of the system available period. The dead time shall be logged and the duration of the OAD extended for an amount of time equal to the total dead time.
- G. Completion of a seven (7) consecutive day period without any restarts of the OAD and with system availability in excess of 99.7 percent will constitute acceptance of the PICS by OWNER.
- H. All parts and maintenance materials required to repair the system prior to completion of the OAD shall be supplied by CONTRACTOR at no additional cost to OWNER. If parts are obtained from the required plant spare parts inventory, they shall be replaced to provide a full complement of parts as specified.
- I. A Plant Monitoring and Control System Malfunction/Repair Reporting Form shall be completed by the plant personnel and ENGINEER to document system failures, to record CONTRACTOR notification, arrival and repair times and CONTRACTOR repair actions. Format of the form shall be developed and agreed upon prior to the start of the OAD.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 13500
PROCESS CONTROL SYSTEM FACTORY TESTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope

1. PICS SUPPLIER shall provide all labor, materials, equipment, and incidentals as specified and required for factory testing at their respective facilities to verify that system their components function properly, compatible with each other's system and comply with the functional and performance requirements of the Contract Documents.
2. Perform factory testing on the following types of equipment:
 - a. Control panels,
 - b. Graphical screens on OIT's and configured OIT software provided by PICS supplier.
3. Perform factory testing on the process control systems for the following process equipment:
 - a. Control Panel PLC-E1
4. PICS SUPPLIER shall advise ENGINEER in writing of the scheduled dates for process control systems factory testing; submit such notice not less than 28 days prior to the scheduled start of factory testing. The PICS SUPPLIER shall make all arrangements and pay all costs for six (6) OWNER/ENGINEER representatives to be present at their factory testing facility (located within the USA) during operational testing of the process control systems at their respective factories, either for individual units or for the integrated system. In lieu of OWNER and ENGINEER witnessing the process control system factory testing, CONTRACTOR shall submit a letter, sealed and signed by a professional engineer, certifying that the required factory testing was successfully completed in accordance with testing procedure approved by ENGINEER and the Contract Documents.

B. Related Sections:

1. 13600, Process Control System General Provisions.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. Professional Engineer:
 - a. Engage a registered professional engineer legally qualified to practice and experienced in providing the engineering services

of the kind indicated. Professional engineer may be an employee of manufacturer.

- b. Submit qualifications data.
- c. Responsibilities include but are not necessarily limited to:
 - i. Preparing or supervising the preparation of factory test set-ups.
 - ii. Performing or supervising performance of factory testing, interpretation and engineering analysis of factory testing data, and preparation of test reports.
 - iii. Certifying that factory tests performed and results achieved comply with the Contract Documents.

B. Action Submittals: Submit the following:

1. Testing Plans:

- a. Submit factory test procedures in accordance with Section 13600, Process Control System General Provisions, for all equipment listed in Paragraph 1.01.A of this Section. Obtain ENGINEER's acceptance of testing plan not less than 28 days prior to scheduled start of factory test.

C. Informational Submittals: Submit the following:

1. Source Quality Control Submittals:

- a. Written results of factory testing for process control systems. Submit the complete factory test report within two weeks after completion of the factory test.
- b. Certification of factory testing results by professional engineer.

2. Qualifications Statements:

- a. Professional engineer.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Inspections Prior to Factory Testing:

- 1. Inspect each panel, console, and cabinet to verify compliance with the Contract documents, and approved Shop Drawings and approved other CONTRACTOR submittals.
- 2. Inspection shall include, but not be limited to, the following:
 - a. Nameplates and tags.
 - b. Wire sizes and color coding.
 - c. Terminal block contact ratings and numbers.
 - d. Panel-mounted equipment and identification.
 - e. External and internal panel layout.

- f. Proper wiring practices and grounding.
 - g. Enclosure flatness, finish and color.
 - h. NEMA rating and environmental control equipment.
 - 3. Correct materials and equipment that do not comply with the Contract Documents and submittals approved by ENGINEER, and re-inspect until compliance is verified.
- B. Factory Tests:
- 1. System Hardware Operational Testing:
 - a. Test each input/output device and component to verify operability. If panel or device being tested contains pneumatic systems, test the instruments associated with such systems to verify that calibration.
 - b. Test all system hardware components to verify proper operation of the equipment as stand-alone units and as a system. Tests shall include, but are not necessarily limited to, the following:
 - i. AC/DC power checks.
 - ii. Power fail/restart tests.
 - iii. Verify that network switch, and fiber-optic converters are powered by separate circuits.
 - iv. 4) Verify that quantity of circuits assigned to power field instruments corresponds to approved Shop Drawings and approved other CONTRACTOR submittals.
 - c. Criteria for Acceptance: System hardware operational testing shall acceptably demonstrate that specified and required equipment operations capabilities function properly.
 - d. Test remote I/O, operator interface terminals, linking devices, and similar devices, to verify that communication between units functions properly.
 - e. Perform an integrated system test, with all control system equipment connected (excluding field sensors and instruments), to verify that equipment performs and functions properly as an integrated system. During the factory test, simulate field sensors and instruments using appropriate signal generators, switches, and jumper cables.
 - f. Separately test each panel furnished under this Contract to verify that panel instruments and processors are perform and function properly in accordance with the Contract Documents. For the factory test required in this Section, simulate field sensors and field instruments using appropriate signal generators, switches, and jumper cables.

2. System Hardware Demonstration

- a. PICS shall perform and be solely responsible for system hardware demonstration of their systems factory test.
- b. Preparation:
 - i. System performance shall be tested using fully-integrated system, including all software and hardware. Entire control system, including one of each type of field device with interconnecting cables, shall be assembled at the factory test location and simulated inputs applied. Signal generators shall be appropriately sized and calibrated for full range of use and shall have a power source to accommodate not less than a full day of testing. Prior to the factory test, provide process I/O simulation panel that includes the following:
 - I. Toggle switches to simulate field or other input contacts.
 - II. Indicating lights to simulate outputs from tested panels.
 - III. Control relays to simulate motor control center coil inputs.
 - IV. Time relays to simulate position switches.
 - V. Indications (in milliamps) to indicate every 4 to 20 ma-dc output from tested panel.
 - VI. Potentiometers to simulate 4 to 20 ma-dc inputs to tested panel.
 - VII. Each device shall have nameplate with description and device's process and instrumentation Drawings (P&ID) tag number. Nameplates shall be removable and interchangeable for multiple use of the panel during the test.
 - ii. Operator Interfaces: Prior to factory testing of the system, configure the display environments in accordance with the display structure agreed upon between PICS, ENGINEER, and OWNER. Load and link database parameters to the specified fields.
- c. Factory Test:
 - i. PICS shall demonstrate system software utility programs and system software security programs incorporated into their control system, to demonstrate proper functioning of the various functions and capabilities specified.

- ii. Perform complete system test, during which entire system shall operate continuously without failure in accordance with the Contract Documents.
- iii. Demonstrate the monitoring and control information displayed on each HMI screen, based on simulation of each associated point for each screen, in accordance with test procedure approved by ENGINEER. Simulation through forced values in the PLC programming is acceptable. In addition, OWNER or ENGINEER will randomly select, at the time of the factory test, additional inputs and outputs to be simulated in quantity not less than five percent of total I/O quantity. Demonstrate that monitoring and control application software associated with I/O points performs and functions as intended.
- iv. Demonstrate communications between integrated system elements; include such demonstration in the testing procedure submittal, where applicable.
- v. Operator Interfaces:
 - I. During factory test, demonstrate overall display structure, including environment configurations, passwords, security, and other parameters and functions.
 - II. Review menu display contents to demonstrate how an operations person will navigate within the overall display structure.
 - III. Demonstrate assignment of displays to annunciator keys.
 - IV. Review each graphic display for correctness relative to layout, symbols, color scheme, and other requirements.
 - V. Demonstrate operation of standard alarm management displays (current alarm display, alarm history, and similar alarm displays).
 - VI. Perform demonstration of each type of report specified. Printing shall be an integral part of the report demonstration.
 - VII. Perform testing of new graphics developed for the existing SCADA software.

PART 3 - EXECUTION (NOT USED)

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SECTION 13600
PROCESS CONTROL SYSTEM GENERAL PROVISIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope:
1. This section covers the furnishing and installation of an instrumentation and control system. The system shall be furnished as specified, complete with all software, hardware, input/output hardware, instrumentation, and all devices, accessories, appurtenances, testing, system commissioning and training necessary for proper operation. All other process instrumentation and control systems shall be furnished under this section by a single Process Instrumentation Control System (PICS) Supplier herein called the "PICS Supplier".
 2. PICS Supplier shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish, install, calibrate, test, start-up and place in satisfactory operation a complete process instrumentation control system.
 3. The process instrumentation and control Work includes, but is not limited to, the following:
 - a. SCADA software modifications.
 - b. Panels and panel-mounted instruments and devices.
 - c. Programmable logic controllers (PLC) and software.
 - d. Human-machine interface (HMI) software and configuration.
 - e. Local area network hardware and software.
 - f. Uninterruptible power supply.
 - g. Programming and configuring of control panels and SCADA software including remote dial out.
 - h. Historical Database, trending, report generation
- B. PICS shall monitor, store, display, and log process and equipment operating information; perform various process control functions; and generate various reports.
- C. The Contract Documents describe the required PICS and PICS functions and operational requirements.
- D. All software shall be of the latest releases.
- E. Coordination:
1. Process Controls:

- a. The PICS SUPPLIER, shall be required to attend monthly coordination meetings upon receiving the notice to proceed and once PICS SUPPLIER is on site, coordination meetings will be required every two (2) weeks.
- b. A central computer system is proposed and is provided this contract, the software is VT SCADA. Instruments, PLC's/ PLC's and controls programming (I&C) Work under this contract provided by PICS Supplier shall, as part of the scope, be interfaced with existing computer system. Programming of control logic and configuration of the control system with new process graphical screens - human machine interface (HMI) software is part of the Work. Process control description of process system and its associated equipment is included in Section 13030, Software Control Block Descriptions.
- c. Some panels and equipment provided by others but furnished under other Specification Sections are under this Contract for coordination and integration into the total control system. The CONTRACTOR is responsible for any additional hardware and software that is needed to interface with these panels.
- d. CONTRACTOR shall coordinate with Suppliers of panels and equipment to provide fully functional system complying with the Contract Documents and that interfaces with the central computer system.
- e. Computer system input/output list identifies the inputs and outputs that is required, and is part of this Section. Use the input/output list for coordinating signals between equipment provided under this and other contracts, but may not be totally inclusive, verification is the responsibility of the PICS. Include Work for other vendor supplied furnished control options not on the input/output list at no additional cost to OWNER.

2. PICS Supplier's Responsibilities:

- a. Preparing all process control equipment submittals in accordance with the Contract Documents.
- b. Proper interfacing of instrumentation and control equipment with field equipment, instruments, devices, and panels, including required interfacing with packaged process control systems furnished by other equipment Suppliers, and any required interfacing with the Site's electrical system such as generator or power monitoring.
- c. Review and coordination with manufacturers, other Suppliers, and other contracts of Shop Drawings and other CONTRACTOR submittals for equipment, valves, piping, and appurtenances for ensuring proper interfacing of hardware, and locations and installation requirements of inline devices and instrument taps.

- d. Direct, detailed oversight of installation of instruments, panels, consoles, cabinets, wiring and other components, and related wiring and piping connections.
- e. Calibrating, source quality control, field quality control, and start-up of the system.
- f. Responsibility for correction period obligations for the PICS.
- g. Training operations and maintenance personnel in operation and maintenance (including calibration and troubleshooting) of the PICS.

1.02 REFERENCES

- A. Standards referenced in this Section are:
 - 1. ANSI/ASQ Z1.4, Sampling Procedures and Tables For Inspection By Attributes.
 - 2. ISA 5.4, Instrument Loop Diagrams.
 - 3. ISA 20, Specification Forms for Process Measurement & Control Instruments, Primary Elements & Control Valves.
 - 4. NFPA 79, Electrical Standard for Industrial Machinery.

1.03 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Supplier:
 - a. Shall be financially sound with at least ten years of continuous experience in designing, implementing, supplying, and supporting process control systems for municipal water treatment facilities comparable to PICS required for the Project, relative to hardware, software, cost, and complexity.
 - b. Shall have record of at least 10 successful process control system equipment installations in the past year. Upon ENGINEER's request, submit record of experience for at least 8 projects, each with the following information: project name, owner name and contact information, name and contact information for contractor, name and contact information for engineer or architect, approximate and contract value of process control systems Work for which Supplier was responsible,
 - c. Shall be capable of training operations and maintenance personnel in PICS applications, and in operating, programming, and maintaining the control system and equipment.
 - d. Shall have UL-approved panel shop.
 - e. Supply and support system hardware components and software packages of fully developed and field-proven

standardized designs that are not a highly unique, custom, or one-of-a-kind systems.

- f. Possess a thorough, working knowledge of water treatment processes and control philosophy in accordance with standard practices of the water treatment industry.
- g. Possess and maintain a documented program of failure analysis.
- h. PICS Supplier shall be:
 - i. Smart Energy Solutions, Sumterville, FL (321) 229-7643

B. Manufacturers:

- 1. Manufacturers of instrumentation and control equipment furnished for the PICS shall be experienced producing similar equipment and shall have the following qualifications:
 - a. Shall manufacture instrumentation and control system components that are fully-developed, field-proven, and of standardized designs.
 - b. Shall have system of traceability of manufactured unit through production and testing in accordance with ANSI/ASQ Z1.4.
 - c. Shall have guaranteed availability clause (99.99 percent, minimum for three (3) years) for microprocessor-based components and appurtenances.
 - d. Shall have documented product safety policy relevant to materials and equipment proposed for the Work.

C. Pre-submittal Conference

- 1. Schedule and conduct a pre-submittal conference by the PICS Supplier within 45 days after acceptance of PICS Supplier by OWNER.
- 2. Required Attendance for Pre-submittal Conference: CONTRACTOR, ICS Supplier, ENGINEER, and OWNER. Pre-submittal conference will be approximately 8 hours. Conference will be held at The ENGINEERS office unless otherwise acceptable to the entities attending.
- 3. Purpose of pre-submittal conference is to review manner in which PICS Supplier intend to comply with requirements of the Contract Documents relative to PICS submittals before submittals are prepared.
- 4. Bring to pre-submittal conference list of proposed personnel committed to assignment to the Project. List shall include PICS Supplier project manager, project engineer, any field representatives or local service representative, and sales representative(s); and

similar personnel for PICS Supplier. Indicate addresses of personnel not based at Subcontractor's and Supplier's office nearest to the Site.

5. Prepare items listed below for presentation at pre-submittal conference. Submit information to ENGINEER two weeks prior to pre-submittal conference.
 - a. List of materials and equipment required for PICS, and manufacturer and model proposed for each item.
 - b. List of currently-known requests for interpretations of which CONTRACTOR, and PICS Supplier are currently aware.
 - c. List of proposed exceptions to the Contract Documents along with brief explanation of each.
 - d. Proposed PICS network architecture diagram.
 - e. Sample of each type of process control submittal required by the Contract Documents. These may be submittals prepared for other projects.
 - f. Flow chart showing steps to be taken in preparing and coordinating PICS submittals.
 - g. General outline of types of tests to be performed to verify that all sensors and transducers, instruments, and digital processing equipment are functioning properly.

1.04 SUBMITTALS

- A. Action Submittals: Submit the following: In accordance to Div 1 requirements.
 1. Shop Drawings:
 - a. Field Instruments:
 - i. Manufacturer's product name and complete model number of devices proposed for use, including manufacturer's name and address.
 - ii. Instrument tag number in accordance with the Contract Documents.
 - iii. Data sheets and manufacturer's catalog literature. Provide data sheets in accordance with ISA 20 and annotated for features proposed for use. For instruments not included in ISA 20, submit data sheets using a format similar to ISA 20.
 - iv. Description of construction features.
 - v. Performance and operation data.
 - vi. Installation, mounting, and calibration details; instructions and recommendations.
 - vii. Service requirements.
 - viii. Dimensions of instruments and details of mating flanges and locations of closed tanks, pipe sizes for

- insertion instruments, and upstream/downstream straight run pipe lengths required.
 - ix. Range of each device and calibration information
 - x. Descriptions of materials of construction and listing of NEMA ratings for equipment
- b. Panels, Consoles, and Cabinets:
 - i. Layout drawings that include:
 - I. Front, rear, and internal panel views to scale.
 - II. Tag number and functional name of components mounted in and on panel, console, or cabinet, as applicable.
 - III. Product information on panel components.
 - IV. Nameplate location and legend including text, letter size and colors to be used.
 - V. Location of anchorage connections.
 - VI. Location of external wiring and piping connections.
 - VII. Mounting and installation details, coordinated with actual application.
 - VIII. Proposed layouts and sizes of operator interface graphic display panels and alarm annunciator panels.
 - IX. Calculations substantiating panel heating and cooling provisions proposed.
 - X. Subpanel layouts and mounting details for items located inside control panels.
 - ii. Product information on panel components including:
 - I. Manufacturer's product name and complete model number of devices being provided, including manufacturer's name and address.
 - II. Instrument tag number in accordance with the Contract Documents.
 - III. Data sheets and catalog literature. Submit data sheets as shown in ISA 20 and annotated for features proposed for use. For instruments not included in ISA 20, submit data sheets with format similar to ISA 20.
 - IV. Description of construction features.
 - V. Performance and operation data.
 - VI. Installation, mounting, and calibration details; instructions and recommendations.
 - VII. Service requirements
 - iii. Wiring and piping diagrams, including the following:

- I. Name of each panel, console, or cabinet.
 - II. Wire sizes and types.
 - III. Pipe sizes and types.
 - IV. Terminal strip and terminal numbers.
 - V. Wire color coding.
 - VI. Functional name and manufacturer's designation for components to which wiring and piping are connected.
 - VII. Lightning and surge protection grounding.
- iv. Electrical control schematics in accordance with NFPA 79. Control schematics shall be in accordance with convention indicated in Annex D of NFPA 79. Standardized wiring diagrams that do not accurately reflect actual wiring to be furnished are unacceptable. Tables or charts for describing wire numbers are unacceptable.
- v. Stock list or bill of materials for each panel including tag number, functional name, manufacturer's name, model number and quantity for components mounted in or on the panel or enclosure.
- vi. Detail showing anchorage plan of wire bundles between subpanels and front panel mounted devices.
- c. Field wiring and piping diagrams, include the following:
 - i. Wire and pipe sizes and types.
 - ii. Terminal numbers at field devices and in panels.
 - iii. Fiber optic termination designations in the field and in panels.
 - iv. Color coding.
 - v. Conduit numbers in which wiring will be located.
 - vi. Locations, functional names, and manufacturer's designations of items to which wiring or piping are connected.
- d. Proposed operator interface graphics layouts. Each graphic display and process report layout will be subject to modification from CONTRACTOR's submitted format within limits of software package used for development. Implement such modifications in accordance with ENGINEER's written comments on the submittal.
- e. Plant monitoring and control system (PMCS):
 - i. Submit the following general information:
 - I. Detailed block diagram showing system hardware configuration and identifying model numbers of system components.

- II. Software listings for operating system, applications, and HMI.
 - III. Software language and organization.
 - IV. Format, protocol and procedures for data transmission and communications with input/output modules and peripheral devices, including wide area network (WAN) or local area network (LAN) devices.
 - V. HMI interfacing details, licensing structure, and included functions.
 - VI. Control and failure modes.
 - f. Online and offline capabilities for programming, system utilities, and diagnostics.
 - g. Input/Output Information:
 - i. Input/output (I/O) point listing with I/O module cross-reference identification.
 - ii. I/O module cross-reference identification based on I/O address list developed by PICS Supplier.
 - h. Database listing, including all I/O points.
 - i. Suggested detailed format and configuration of log reports, alarm summaries, printer outputs, displays, and graphics.
2. Hardware:
- a. Layout drawings showing front, rear, end, and plan views to scale of equipment, I/O components, power supplies, and peripheral devices.
 - b. Equipment ventilation and cooling requirements.
 - c. Interconnection diagrams, including termination details, cable identification list, and cable length.
 - d. Drawings showing equipment layout.
 - e. Installation requirements, instructions, and recommendations.
3. Software:
- a. Licensing agreement with name of licensee, renewal requirements, release and versions, expiration dates (if any) and upcoming releases scheduled before Project completion. When upcoming releases are expected, provide descriptions, when available, of features that differ from the proposed release.
 - b. Provide information of number of run, client, and development licenses as well as I/O point count limit per license.
 - c. Standard technical and instructional documentation covering software for utility, system support, system documentation, display, communications, data logging and storage and

- diagnostic functions. Submit this information as electronic files.
- d. Standard technical documentation covering all aspects of the computer system software functions and capabilities, including instruction set description and programming procedures related to monitoring, display, logging, reporting and alarming functions.
 - e. Detailed functional descriptions of application programs explaining control, display, logging and alarming features to be provided and functions to be performed.
4. Documentation describing memory type, size and structure and listing size of system memory, I/O and data table memory and size of memory available for control programs.
 5. System I/O Loop Wiring Diagrams: Prepare Shop Drawings on module-by-module basis and include the following information:
 - a. Rack numbers, module type and slot number, and module terminal point numbers. Include location and identification of intermediate panel and field terminal blocks and terminal numbers to which I/O wiring and power supply wiring is connected. Identify power supply circuits with designation numbers and ratings.
 - b. Wiring types, wire numbers, and color coding.
 - c. Designation of conduits in which field I/O wiring will be installed.
 - d. Location, functional name, tag numbers and manufacturer's module numbers of panel and field devices and instruments to which I/O wiring will be connected.
 - e. Prepare loop wiring diagrams in accordance with ISA 5.4.
 - f. Complete point-to-point interconnection wiring diagrams of field wiring associated with the system. Diagrams shall include the following:
 - i. Field wiring between each equipment item, panel, instruments, and other devices, and wiring to control stations, panelboards, and motor starters. Some of this equipment may be specified in other Divisions. CONTRACTOR is responsible for providing complete point-to-point interconnection wiring diagrams for control and monitoring of that equipment.
 - ii. Numbered terminal block and terminal identification for each wire termination.
 - iii. Identification of assigned wire numbers for interconnections. Assign each wire a unique number.
 - iv. Schedule showing the wiring numbers and the conduit number in which the numbered wire is installed.

- v. Junction and pull boxes through which wiring will be routed.
- vi. Identification of equipment in accordance with the Contract Documents.

6. Product Data:

- a. Product data for field instruments in accordance with requirements for Shop Drawings in this Section.
- b. Product data for panels, consoles, and cabinets in accordance with requirements for Shop Drawings in this Section.
- c. Product data for field wiring and piping provided for instrumentation and control service and not included under other Sections or contracts.
- d. Product data for SCADA system, including software and hardware. Requirements for software product data are included in requirements for Shop Drawings under this Section.

7. Samples:

- a. Color charts for finish paint for metallic panels. Provide full range of paint manufacturer's standard and custom colors. Color selection will be by ENGINEER.
- b. Color charts for fiberglass-reinforced panels. Provide full range of panel manufacturer's standard and custom colors. Color selection will be by ENGINEER.

8. Factory Acceptance Test Procedure: Submit proposed procedures for factory testing required to comply with the Contract Documents. Test procedure shall include the following:

- a. Visual inspection of components and assembly.
- b. Description of hardware operational testing.
- c. Description of software demonstration.
- d. Description of testing equipment to be used.
- e. Sign-off sheets to be used at time of testing.

B. Informational Submittals: Submit the following:

- 1. Documents to be submitted prior to pre-submittal conference, in accordance with this specification.
- 2. System Software Documentation: Submit preliminary software documentation not later than 28 days prior to scheduled start of factory testing. Software documentation shall include the following:
- 3. Complete printed copies of all programming.
 - a. Complete listing of external and internal I/O address assignments, register assignments and preset constant values

- with function point descriptions. List unused/undefined I/O and data table registers available.
- b. Copies of all configured HMI screens.
- 4. Manufacturer's Instructions:
 - a. Shipping, handling, storage, installation, and start-up instructions.
 - b. Templates for anchorage devices for materials and equipment that will be anchored to concrete or masonry.
- 5. Source Quality Control Submittals:
 - a. Results of factory testing.
- 6. Special Procedure Submittals:
 - a. Notification to OWNER and ENGINEER at least 14 days before readiness to begin system checkout at the Site. Schedule system checkout on dates acceptable to OWNER and ENGINEER.
 - b. Written procedure for system checkout. Submit not less than 90 days prior to starting system checkout.
 - c. Ninety days prior to starting system checkout submit written procedure for start-up.
- 7. Field Quality Control Submittals:
 - a. Submit the following prior to commencing system checkout and start-up.
 - i. Completed calibration sheets for each installed instrument showing five-point calibration (zero, 25, 50, 75, 100 percent of span), signed by factory-authorized serviceman.
 - ii. Field calibration reports
 - iii. Field testing reports.
- 8. Supplier's Reports:
 - a. Installation inspection and check-out report.
 - b. Submit written report of results of each visit to Site by Supplier's service technician, including purpose and time of visit, tasks performed, and results obtained. Submit within two days of completion of visit to the Site.
- 9. Qualifications Statements:
 - a. PICS Supplier.
 - b. Manufacturers, when required by ENGINEER.
- C. Closeout Submittals: Submit the following:
 - 1. Operations and Maintenance Data:

- a. Submit in accordance with Section, Operation and Maintenance Data.
 - b. Include complete up-to-date system software documentation. Provide hardcopy and electronic copies.
- 2. Record Documentation:
 - a. Prepare and submit record documents in accordance with, Project Record Documents.
 - b. Revise all PICS Shop Drawings to reflect as-built conditions in accordance with the following.
 - i. Use" as-built" updates of approved Shop Drawings and submittals in operation and maintenance manuals.
 - ii. Half-size black line prints of wiring diagrams applicable to each control panel shall be laminated and placed in envelope inside a suitable print pocket or container inside each control panel.
 - iii. Submit drawings of the point-to-point interconnection wiring diagrams updated to reflect final as-built equipment information and as-installed field installation information.
- D. Maintenance Materials Submittals: Submit the following:
 - 1. Spare Parts and Test Equipment
 - a. General
 - i. Furnish the spare parts and test equipment in accordance with the Contract Documents, identical to and interchangeable with similar materials and equipment provided for the PICS under the Contract.
 - ii. Provide source quality control for spare parts as part of factory testing prior to shipment of process control system equipment.
 - iii. For process sensors and other analog instruments, Supplier shall submit a separate quotation for recommended list of spare parts and test equipment. Separately list and price each item recommended. Spare parts quotation shall include a statement that prices quoted are valid for a period of two (2) year from date of equipment installation and that Supplier understands that OWNER reserves the right to purchase none, any, or all parts quoted. Upon request, Supplier shall submit documentation that stock of spare parts and test equipment is obtainable within 48 hours of receipt of OWNER's order.
 - b. Furnish the following spare parts per PLC supplied:

- i. Five of each type of input/output relay for each quantity of twenty five (25) or fraction thereof provided under the Contract.
- ii. One complete PLC, including One type of each PLC input/output module or card used.
- iii. One replacement power supply for each type and size provided under the Contract.
- iv. One-year supply of all expendable or consumable materials.
- v. One per quantity of five or fraction thereof of gauges, indicators, and switches provided, complete with diaphragm seals, filled and ready to use.
- vi. Twelve of each type and size of fuse used in instruments.

2. Software:

- a. Furnish copies of all software (with the selected versions) licensed to Columbia County. Follow the submittal guidelines for software submittals.
- b. Submit copies of programming and configuration files developed specifically for the Project in accordance with Operations and Maintenance Data.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Prior to packaging, each manufacturer or Supplier shall securely attach tag number and instructions for proper field handling and installation to each instrument. Refer to Div 1.

PART 2 - PRODUCTS

2.01 PICS – GENERAL PROVISIONS FOR PRODUCTS

A. General:

- 1. All electrically-powered equipment and devices shall be suitable for operation on 115-volt plus-or-minus 10 percent, 60 Hertz plus-or-minus two Hertz power. If different voltage or closer regulation is required, provide suitable regulator or transformer.
- 2. Provide appropriate power supplies for all two-wire transmitters, loops for monitoring discrete inputs and necessary outputs. Install power supplies mounted in enclosures, and install in appropriate control room or field panel.
- 3. Power supplies shall be suitable for minimum of 130 percent of the maximum simultaneous current draw.
- 4. Provide power on-off switch or air circuit breaker for each item requiring electrical power.

5. Provide isolation transformers, line voltage regulators and power distribution panels for the distributed digital portions of the PICS to eliminate electrical noise and/or transients entering on the primary power line.
6. Unless otherwise shown or indicated in the Contract Documents, control system shall be furnished to use 4 to 20 mA DC analog signals.
7. Provide signal converters and repeaters where required. Analog inputs to distributed control system shall be through appropriate repeaters to provide signal isolation where series-looped with other devices and to allow loop to maintain integrity even when distributed control system is out of service. Power supplies shall adequate for signal converter and repeater loads.
8. Signals shall be isolated from ground.
9. Signals shall not have a transient DC voltage exceeding 300 volts over one millisecond nor a DC component over 300 volts.
10. PICS and associated input/output wiring will be used in a facility environment where there can be high-energy AC fields, DC control pulses, and varying ground potentials between the sensors/transducers or input contact locations and PICS components. PICS shall be adequate to provide proper protection against interferences from all such possible situations.
11. Instrumentation and PICS components shall be heavy-duty types, suitable for continuous service in a municipal water treatment plant environment. Furnish products that are currently in production at the time products are shipped from the factory. All equipment furnished shall be of modular construction and be capable of field expansion through installation of plug-in circuit cards and additional cabinets as necessary. Logic and control loops shall be fail-safe.
12. Instrumentation and other PICS components shall return automatically to accurate measurement within 15 seconds upon restoration of power after a power failure, and when transferred to standby power supply.
13. Provide surge protection for instruments and all other PICS components that could be damaged by electrical surges.
14. Field-mounted instruments and PICS components shall be suitable for installation in humid and corrosive service conditions. Field-mounted instrument enclosures, junction boxes, and appurtenances shall comply with NEMA 4X requirements:
 - a. FRP in Chemical Containment Areas
 - b. 316 SS for all other

- c. Refer to drawings for additional requirements.
- 15. Relays with interconnections to field devices shall be wired through terminal blocks. Terminals as part of the relay base are unacceptable.
- 16. Panel mounted instruments, switches, and other devices shall be selected and arranged to present a pleasing coordinated appearance. Front-of-panel-mounted devices shall be of the same manufacturer and model line.
- 17. All components furnished, including field-mounted and rear-of-panel instruments, shall be tagged with the item number and nomenclature as shown and the instrument index in the Contract Documents or, as applicable, the "data sheets" that are part of the Contract Documents.
- 18. Ranges and scales specified in the Contract Documents shall be coordinated to suit equipment actually furnished. Range, scale, and set point values specified in other Sections of Division 40 are for initial setting and configuration. Coordinate specified values with actual equipment furnished to implement proper and stable process action as systems are placed in operation.
- 19. Field-mounted devices shall be treated with an anti-fungus spray.
- 20. Field-mounted devices shall be protected from exposure to freezing temperatures.

B. Environmental Conditions:

- 1. PICS and its components shall be designed and constructed for continuous operation under the following temperature and humidity conditions:
 - a. Equipment and Devices Installed in Control Rooms:
 - i. Ambient Temperature: 60 degrees F to 80 degrees F normal range; and 40 degrees F to 105 degrees F occasional maximum extremes.
 - ii. Relative Humidity: 80 percent, normal; 95 percent maximum.
 - b. Equipment and devices installed at indoor locations (other than control rooms) for digital processing equipment hardware, control panels, and instruments:
 - i. Ambient Temperature: 40 degrees F to 120 degrees F.
 - ii. Relative Humidity: 98 percent maximum.
 - c. Equipment and Devices Installed Outdoors:
 - i. Ambient Temperature: -10 degrees F to 120 degrees F.

- ii. Relative Humidity: 100 percent maximum.

PART 3 - EXECUTION

3.01 PICS – GENERAL PROVISIONS FOR EXECUTION

- A. Refer to Sections 13030 through 13600 for execution requirements for the PICS.

END OF SECTION

SECTION 16050

ELECTRICAL - GENERAL PROVISIONS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish all labor, materials, equipment and incidentals required for a complete electrical system as hereinafter specified and shown on the Drawings, whether or not specifically shown or called for.
2. The work, apparatus and materials which shall be furnished under these Specifications and accompanying Drawings shall include all items listed hereinafter an/or shown on the Drawings. All materials necessary for the complete installation shall be furnished and installed by the Contractor to provide complete power, generator, lighting systems, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein whether or not specifically shown or called for. Certain equipment will be furnished as specified in other Section of this specification which will require conduit and wire to complete the installation as required.
3. The Contractor shall furnish and install the necessary cables, transformers, motor control centers, protective devices (surge protection), conductors, exterior electrical system, etc., to serve motor loads, lighting loads and miscellaneous electrical loads as indicated on the Drawings and/or as specified hereinafter.
4. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; substandard work will be rejected.
5. Provide permitting and acceptance testing.
6. Make all field connections to process instrument panels and other control panels furnished under other Divisions of these Specifications.
7. For process instrumentation furnish and install all conduit, wire and interconnections between primary elements, transmitters, local indicators and receivers. Coordinate wire termination with the instrumentation supplier.
8. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material, equipment, appliances and all work which may be reasonably implied as being incidental to the work of this Section shall be furnished at no extra cost.

9. Each bidder or his authorized representatives shall, before preparing a bid, visit all areas of the existing building and/or proposed site in which work will take place and be performed to inspect carefully the present installation and conditions. The submission of the bid by this bidder shall be considered evidence that the bidder has visited the project and noted the locations and conditions under which the work will be performed and that the bidder takes full responsibility for a complete knowledge of all factors governing his work.
10. All necessary temporary power requirements are the responsibility of the Contractor and shall be furnished at to extra cost to the Owner.
11. All necessary temporary power, control and instrumentation requirements are the responsibility of the Contractor and shall be furnished at no extra cost to the Owner. Power and controls shall be furnished to all existing equipment at all times.

B. Service and Metering:

1. Permanent electrical power and metering will be provided by the at 227/480 volts, 3-phase, 4 wire, wye, solid grounded, 60 Hertz.

C. Codes, Inspections and Fees:

1. All material and installation shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes.
2. Pay all fees required for permits, inspections, and connections.

D. Tests:

1. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

E. Interpretation of Drawings:

1. The Drawings are not intended to show exact location, quantity or size of conduit runs. All installation of the raceway system shall be as directed by approved shop drawing. Any installation of a raceway system before shop drawing submittal and approval will at the sole risk of the Contractor.
2. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.
3. Unless otherwise approved by the Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
4. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.

5. The Contractor shall harmonize the work of the different trades so that interferences between conduits, piping, equipment, architectural and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets, fittings, etc., required to accomplish this shall be furnished and installed by the Contractor without additional expense to the Owner. In case interference develops, the Owner's authorized representative is to decide which equipment, piping, etc., must be relocated, regardless of which was installed first.
6. Verify with the Engineer exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.
7. The locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of electrical work and, in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
8. Surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.
9. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.
10. The ratings of motors and other electrically operated devices together with the size shown for their branch circuit conductors and conduits are approximate only and are indicative of the probable power requirements insofar as they can be determined in advance of the purchases of the equipment.
11. All connections to equipment shall be made as shown, specified, required, and directed and in accordance with the approved shop drawings, regardless of the number of conductors shown on the Electrical Drawings.

F. Size of Equipment:

1. Investigate each space in the building through which equipment must pass to reach its final location. If necessary, the manufacturer shall be required to ship his material in sections sized to permit passing through such restricted areas in the building.
2. The equipment shall be kept upright at all times. When equipment has to be tilted for each of passage through restricted areas during transportation, the manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

G. Component Interconnections:

1. Component equipment furnished under this Specification will not be furnished as integrated systems.
2. Analyze all systems components and their shop drawings; identify all terminals and prepare drawings or wiring tables necessary for component interconnection.

H. Record Drawings:

1. As the work progresses, legibly record all field changes on a set of project Contract Drawings. When the project is complete furnish a complete set of reproducible "as-built" drawings for the Project Record Documents, Section 01780.

1.02 SUBMITTALS

A. Material and Shop Drawings:

1. As specified under Section 01300, shop drawings shall be submitted for approval of all materials, equipment, apparatus, and other items as required by the Engineer.
2. Shop drawings shall be submitted for the following equipment:
 - a. Motor Control Centers
 - b. Disconnect Switches
 - c. Wire and Cable
 - d. Supporting Devices
 - e. Variable Frequency Drives
 - f. Test Data
3. The manufacturers' name and product designation or catalog numbers shall be submitted for the following material:
 - a. Conduit
 - b. Receptacles
 - c. Boxes and Fittings
 - d. Switches
 - e. Lamps

f. Control Relays

4. Prior to submittal by the Contractor, all shop drawings shall be checked for accuracy and contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.
5. The Engineer's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship required by the Specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.
6. The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.
7. No material shall be ordered or shop work started until the Engineer's approval of shop drawings has been given.

B. Manufacturer's Services

1. Provide manufacturer's services for testing and start-up of the following equipment:
 - a. Variable Frequency Drives
 - b. Motor Control Centers
2. Provide manufacturer's of the above listed equipment shall provide an experienced Field Service Engineer to accomplish the following tasks:
 - a. The equipment shall be visually inspected upon completion of installation and prior to energizing to assure that wiring is correct, interconnection complete and the installation is in compliance with the manufacturer's criteria. Documentation shall be reviewed to assure that all Drawings, operation and maintenance manuals, parts list and other data required to check out and sustain equipment operation is available on site. Documentation shall be red-lined to reflect any changes or modifications made during the installation so that the "as-built" equipment configuration will be correctly defined. Spare parts shall be inventoried to assure correct type and quantity.
 - b. The Field Service Engineers shall provide engineering support during the energizing and check out of each major equipment assembly. They shall perform any calibration or adjustment required for the equipment to meet the manufacturer's performance specifications.

- c. Upon satisfactory completion of equipment test, they shall provide engineering support of system tests to be performed in accordance with manufacturer's test specifications.
- d. Three (3) 4-hour training sessions (one for each system) on operation, and two (2) 4-hour training sessions (one for each system) on maintenance and trouble-shooting procedures shall be provided for the Owner's maintenance personnel. All training shall be conducted at a facility provided by the Owner. The maintenance and trouble-shooting sessions shall be conducted with record "as-built" electrical drawings sufficient for a class of eight personnel.
- e. A final report shall be written and submitted to the Contractor within fourteen days from completion of final system testing. The report shall document the inspection and test activity, define any open problems and recommend remedial action.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or manufacturer's specifications shall be submitted for approval as required by the Engineer.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc., listed.
- C. Electrical equipment shall, at all times during construction, be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such special tests as directed by the Engineer, at the cost and expense of the Contractor, or shall be replaced by the Contractor at his own expense.
- D. All fasteners shall be type 316 stainless steel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Provide and place all sleeves for conduits penetrating floors, walls, partition, etc. Locate all necessary slots for electrical work and form before concrete is poured.
- B. All cutting and patching shall be done in a thoroughly workmanlike manner.

3.02 INSPECTION AND TESTING

- A. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

END OF SECTION

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SECTION 16060
POWER DISTRIBUTION SYSTEM COORDINATION STUDY

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, equipment, services, and incidentals required to perform Power System Studies and distribution system field testing.
- B. The Power System Studies shall include a Short Circuit Study, a Protective Device Evaluation Study, Arc Flash Study, and a Protective Device Coordination Study for a completely coordinated Power Distribution System for both the proposed and existing systems.

1.02 REFERENCES

- A. Standards referenced in this Section are listed below:
1. American National Standards Institute, (ANSI).
 - a. ANSI C37.04, Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
 - b. ANSI C37.010, Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Basis.
 2. Institute of Electrical and Electronics Engineers, (IEEE).
 - a. IEEE 141, Electric Power Distribution in Industrial Plants.
 - b. IEEE 399, Recommended Practice for Industrial and Commercial Power System Analysis.
 3. National Electrical Code, (NEC).

1.03 QUALITY ASSURANCE

A. Source Quality Control:

1. Retain the services of a Registered Professional Engineer, to perform the Power System Studies and field services. The Registered Professional Engineer shall be from an independent consulting firm or from the manufacturer of the power distribution equipment.
2. Coordinate with the Engineer performing the studies and assist him in the collection
3. All information pertaining to the existing system necessary to perform the studies shall be obtained in advance prior to performing the studies.
4. All motor starting and transformer information shall be based upon the equipment installed distribution system. The Field Engineer shall be from the manufacturer of the power distribution equipment.

B. All test equipment and instrument calibration shall be in accordance with the latest edition of the accuracy standard of the U.S. National Institute of Standards and Technology.

1.04 SUBMITTALS

A. Shop Drawings: Submit the following:

1. Copies of calculations and results of the Short Circuit Study, Protective Device Evaluation and Coordination Studies in a report format. The report shall be stamped and signed by the Registered Professional Engineer.
2. Work sequence for the field testing shall be submitted in advance prior to performing tests. The sequence shall indicate the schedule of work, time frame and downtime for the equipment.
3. Time current curves for all protective devices included within the power system studies.

B. Reports:

1. Field test report shall be submitted.

PART 2 PRODUCTS

2.01 POWER SYSTEM STUDIES

A. General:

1. Provide a current and complete Short Circuit Study, Protective Device Evaluation Study, and a Protective Device Coordination Study for the Electrical Distribution System.
2. The studies shall include all portions of the high and low voltage electrical distribution system from the normal and alternate sources of power through the low- voltage distribution system. Normal system operating method, alternate operation, and operations which could result in maximum fault conditions shall be thoroughly covered in the study.
3. Problem areas or equipment inadequacies shall be promptly brought to the ENGINEER'S attention.

B. Short Circuit Study:

1. The Short Circuit Study shall be performed with the aid of a computer program.
2. The study input data shall include the utility company's short circuit, single and three phase contributions, with the X/R ratio, the resistance and reactance components of and all other applicable circuit parameters.
3. Short-circuit momentary duties and interrupting duties shall be calculated on the basis of maximum available fault current at each switchgear bus, switchboard, motor control center, distribution panelboard, pertinent branch circuit panelboards, and other significant locations through the system.
4. The short circuit tabulations shall include symmetrical fault currents, and X/R ratios. For each fault location, the total duty on the bus, as well as the individual contribution from each connected branch, including motor back EMF current contributions shall be listed with its respective X/R ratio.

C. Protective Device Evaluation Study:

1. A Protective Device Evaluation Study shall be performed to determine the adequacy of circuit breakers, controllers, surge arresters, busways, switches, and fuses by tabulating and comparing the short-circuit ratings of these devices with the available fault currents.
2. Appropriate multiplying factors based upon system X/R ratios and protective device rating standards shall be applied.

D. Protective Device Coordination Study:

1. A Protective Device Coordination Study shall be performed to select or to check the selections of the power fuse ratings, protective relay characteristics and settings, ratios and characteristics of associated voltage and current transformers, and low-voltage breaker trip characteristics and setting.
2. The overcurrent device settings computed in the Protective Device Coordination Study shall provide complete 100 percent selectivity. The system shall be selectively coordinated such that only the device nearest a fault will operate to remove the faulted circuit. System selectivity shall be based on both the magnitude and the duration of a fault current.
3. The Protective Device Coordination Study shall include all voltage classes of equipment starting at the utility's incoming line protective device down to and including each of the medium and low voltage equipment. The phase and ground overcurrent and the phase and ground fault protection shall be included, as well as settings for all other adjustable protective devices.
4. The time-current characteristics of the installed protective devices shall be plotted on the appropriate log-log paper. Reasonable coordination intervals and separation of characteristic curves shall be maintained. The coordination plots for phase and ground protective devices shall be provided on a complete system basis. Sufficient curves shall be used to clearly indicate selective coordination achieved through the utility main breaker, power distribution feeder breakers, and the overcurrent devices at each major load center.
5. There shall be a maximum of eight protective devices per plot. Each plot shall be appropriately titled. Plots shall include the following information as required for the circuits shown:
 - a. Representative one-line diagram, legends and types of protective devices selected.
 - b. Power company's relays or fuse characteristics.
 - c. Significant motor starting characteristics.
 - d. Parameters of transformers, ANSI magnetizing inrush and withstand curves.

- e. Operating bands of low voltage circuit breaker trip curves, and fuse curves.
 - f. Relay taps, time dial and instantaneous trip settings.
 - g. Cable damage curves.
 - h. Symmetrical and asymmetrical fault currents.
6. The selection and settings of the protective devices shall be provided separately in a tabulated form listing circuit identification, IEEE device number, current transformer ratios, manufacturer, type, range of adjustment, and recommended settings. A tabulation of the recommended power fuse selection shall be provided for all fuses in the system.

E. Arc Flash Hazard Study:

1. An Arc Flash Hazard Study shall be performed for the electrical distribution system shown on the one-line drawings. The intent of the Arc Flash Hazard Study is to determine hazards that exist at each major piece of electrical equipment shown on the one-line drawing. This includes switchgear, switchboards, panelboards, motor control centers and transformers. The study shall include creation of Arc Flash Hazard Warning Labels listing all items. The Contractor will install the labels. The arc flash hazard study shall consider all operating scenarios during normal conditions alternate operations, emergency power conditions, and any other operations, which could result in maximum arc flash hazard

2.02 STUDY REPORT

- A. The results of the Power Distribution System Coordination Study shall be summarized in a final typewritten report. The report shall include the following Sections:
- 1. Description, purpose, basis, written scope, and a single-line diagram of the Power Distribution System which is included within the scope of the study.
 - 2. Tabulations of circuit breaker, fuses, and other equipment ratings versus calculated short-circuit duties, and commentary regarding same.
 - 3. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.
 - 4. Fault current tabulation including a definition of terms and a guide for interpretation.
 - 5. Tabulation of appropriate tap settings for relay seal-in units.

6. Tabulation of equipment survey information.

PART 3 EXECUTION

3.01 FIELD SERVICES

- A. The Registered Professional Engineer shall conduct an equipment survey of devices and information necessary to perform the Power System Studies.
- B. The survey shall include the following information to the extent applicable:
 1. Manufacturer, type and size of each power fuse.
 2. Manufacturer, type, model and settings for each protective relay, trip unit and circuit breaker.
 3. Current transformer ratios for each protective relay.
 4. Appropriate data of motors and transformers included with the study.
- C. The Registered Professional Engineer, as part of the field service Work, shall collect all data and coordinate with the equipment vendors to establish the proper settings for the actual devices provided.

3.02 FIELD TESTING

- A. Provide field testing of the distribution system in accordance with the manufacturer's recommendations. All field testing shall be performed by the Field Engineer, after the completion and approval of the Power System Studies. The field-testing results shall be documented within a report, with the final settings of all protective devices.
- B. The Field Engineer with necessary tools and equipment shall adjust, set, calibrate and test all protective devices. All protective relays and meters in the medium and low voltage equipment shall be set, adjusted, calibrated and tested in accordance with the manufacturer's recommendations, the coordination study and best industry practice.
- C. Proper operation of all equipment associated with the device under test and its compartment, shall be verified, as well as complete resistance, continuity and polarity tests of power, protective and metering circuits. Any minor adjustments, repairs and lubrication necessary to achieve proper operation shall be considered part of this Contract.

- D. All solid-state trip devices shall be set including all required programming necessary for the protection required. The devices shall be checked and tested for setting and operation. Circuit breakers and/or contactors associated with the trip devices shall be tested for trip and close function with their protective device.

3.03 MAINTENANCE OF OPERATIONS

- A. Since the field-testing work specified may require that certain pieces of equipment be taken out of service, CONTRACTOR shall perform the Work with due regard to maintenance of operations and construction staging in accordance with the requirements of this Section with OWNER'S operation. All testing procedures and schedules must be scheduled in advance prior to any work beginning.

END OF SECTION

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SECTION 16075
ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish and install identification for raceways; power and control cables; conductors; underground-line warning tape, warning labels and signs; instruction signs; equipment identification labels; and any other miscellaneous identification products as shown in the Drawings and specified in this Section.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01300, Submittals and Acceptance:

- A. Product Data: For each electrical identification product indicated.

1.03 WORK SEQUENCE

- A. The Contractor shall coordinate identification names, abbreviations, colors, and other features with requirements in other sections requiring identification applications; Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operations and Maintenance (O&M) Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout the Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with locations of access panels and doors.

- D. Install identifying devices before installing acoustical ceilings and similar concealment.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

- A. American National Standards Institute (ANSI)
 - 1. ANSI Z535—Safety Alerting Standards.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM D638—Standard Test Method for Tensile Properties of Plastics.
 - 2. ASTM D882—Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
- C. American Society of Mechanical Engineers (ASME)
 - 1. ASME A13.1—Scheme for the Identification of Piping Systems.
- D. Institute of Electrical and Electronics Engineers (IEEE)
 - 1. IEEE C2—National Electrical Safety Code.
- E. Occupational Safety and Health Administration (OSHA)
 - 1. 29 CFR 1910.144—Safety Color Code for Marking Physical Hazards.

2. 29 CFR 1910.145—Specifications for Accident Prevention Signs and Tags.

F. National Fire Protection Association (NFPA)

1. NFPA 70—National Electric Code.
2. NFPA 70E—Standard for Electrical Safety in the Workplace.

G. Underwriter's Laboratories (UL)

1. UL 969—Marking and Labeling Systems.

1.05 QUALITY ASSURANCE

- A. Comply with ASME A13.1
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.

PART 2 PRODUCTS

2.01 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ASME A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

- B. Colors for Raceways Carrying Circuits at 600 V or Less:
1. Black letters on an orange field.
 2. Legend: Indicate voltage .
- C. Colors for Raceways Carrying Circuits at More Than 600 V:
1. Black letters on an orange field.
 2. Legend: "DANGER: CONCEALED HIGH-VOLTAGE WIRING" with 3-inch-high letters on 20-inch centers.
- D. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- E. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- G. Tape and Stencil for Raceways Carrying Circuits More Than 600 V: 4-inch-wide black stripes on 10-inch centers diagonally over orange background that extends the full length of raceway or duct and is 12 inches wide. Stop stripes at legends.
- H. Metal Tags: Brass or aluminum, 2-inch-by-2-inch-by-0.05-inch with stamped legend, punched for use with self-locking cable tie fastener.

- I. Write-On Tags: Polyester tag, 0.015-inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

- 1. Marker for Tags: Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.02 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ASME A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- C. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.03 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches.

2.04 FLOOR MARKING TAPE

- A. 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.05 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE,.
3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE, .

C. Tag: Type I:

1. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
2. Overall Thickness: 5 mils.
3. Foil Core Thickness: 0.35 mil.
4. Weight: 28 pounds/1,000 square feet.
5. 3-Inch Tensile According to ASTM D882: 70 lbf and 4,600 psi.

2.06 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
 - 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 2. 1/4-inch grommets in corners for mounting.
 - 3. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs:
 - 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
 - 2. 1/4-inch grommets in corners for mounting.
 - 3. Nominal size, 10 by 14 inches.
- E. Warning label and sign shall include but are not limited to the following legends:
 - 1. Multiple Power Source Warning: "DANGER: ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING: OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
 - 3. Arc Flash Warning Label: Refer to Section 16280, Overcurrent Protective Device Coordination, and NFPA 70E for arc flash warning label requirements.

2.07 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16-inch thick for signs up to 20 square inches and 1/8-inch thick for larger sizes.
 - 1. Engraved legend with black letters on white face.
 - 2. Punched or drilled for mechanical fasteners.
 - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch.
- C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.08 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch.
- B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch. Overlay shall provide a weatherproof and UV-resistant seal for label.
- C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8-inch.
- D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8-inch.

- E. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.09 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.

- 1. Minimum Width: 3/16-inch.
- 2. Tensile Strength at 73°F, According to ASTM D638: 12,000 psi.
- 3. Temperature Range: Minus 40° to plus 185°F.
- 4. Color: Black except where used for color-coding.

- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.

- 1. Minimum Width: 3/16-inch.
- 2. Tensile Strength at 73°F, According to ASTM D638: 12,000 psi.
- 3. Temperature Range: Minus 40° to plus 185°F.
- 4. Color: Black.

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in Division 9 Painting Sections for paint materials and application requirements. Select a paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Verify the identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Align nameplates in center near the top of equipment being marked.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Attach signs and plastic labels with mechanical fasteners appropriate to the location and substrate.
- E. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by the manufacturer of the identification device.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot-maximum intervals in straight runs and at 25-foot-maximum intervals in congested areas.
- G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.

- I. Underground-Line Warning Tape: During backfilling of trenches, install continuous underground-line warning tape directly above line at 12 inches below finished grade. Use multiple tapes where the width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
- J. Painted Identification: Comply with requirements in Division 9 Painting Sections for surface preparation and paint application.

3.02 IDENTIFICATION SCHEDULE

- A. Identify all devices operating at more than 250 VAC phase-to-phase or 125 VAC phase-to-ground with red enamel letters or numerals of appropriate height applied with a stencil.
- B. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl labelself-adhesive vinyl tape applied in bands. Install labels at 30-foot maximum intervals.
- C. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Emergency Power.
 - 2. Power.
 - 3. UPS.
- D. Power wiring and control wiring shall be identified in all handholes with a waterproof permanent tag attached to the cable with plastic cable ties.
- E. Conductors shall be identified at each termination, pull box, junction box, handhole, point of entry to or exit from wireways, panelboards, control panels, and other points of access. Tags or labels shall be securely affixed to the conductor in visible locations. Tags shall be durable plastic with the designation stamped on one side with suitable dies. Labels shall be permanent with legible black characters on white heat-shrink tubing or equivalent identification acceptable to the Owner.

1. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase. Tags or labels shall identify both the switchboard, MCC, panel, etc., it is served from and the circuit number.
2. Control conductor (including monitor and instrumentation conductors) shall be identified by color coding and tag or label as to wire number (corresponding to the manufacturer's wiring diagram) and equipment name.
3. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120V Circuits:
 - (1) Phase A: Black.
 - (2) Phase B: Red.
 - (3) Phase C: Blue.
 - c. Colors for 480/277V Circuits:
 - (1) Phase A: Brown.
 - (2) Phase B: Orange.
 - (3) Phase C: Yellow.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

- F. Power-Circuit Conductor Identification, More than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use plastic tag holder with adhesive-backed phase tags, and a separate tag with the circuit designation.
- G. Install instructional sign, including the associated color-code, for grounded and ungrounded conductors using adhesive-film-type labels.
- H. Conductors to Be Extended in the Future: Attach identification tags to conductors and list source.
- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use a system of marker tape designations that is uniform and consistent with the system used by the manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the O&M Manual.
- J. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for direct-buried cables and for cables in the raceway.
- K. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

- L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment, including but not limited to the following:
 - a. Controls with external control power connections.
- M. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- N. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.
- O. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the O&M Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification. Identification plates shall be furnished for lighting and power panelboards, motor control centers, all line voltage heating and ventilating control panels, fire detector and sprinkler alarms, door bells, pilot lights, disconnect switches, manual starting switches, magnetic starters, and process control devices.

1. Identification plates shall be furnished for all line-voltage enclosed-circuit breakers; the plates shall identify the equipment served, voltage, phase(s), and power source. Circuits 480 volts and above shall have conspicuously located warning signs in accordance with OSHA requirements.
2. Provide nameplates of minimum letter height as scheduled below:
 - a. Panelboards, switchboards, and motor control centers: 1/4-inch, identify panel name; 1/8-inch, identify voltage, phase, number of wires, and source. Panelboards and control panels shall have designation in 1/4-inch high letters and voltage in 1/8-inch high letters centered above door on exterior trim.
 - b. Safety switches: same as above.
 - c. Safety color coding for identification of warning signs shall conform to NEMA Z535.
 - d. Red identification plates reading CAUTION: 480/277 VOLTS shall be provided in switch and outlet boxes containing 277- or 480-volt circuits. An identification plate marked DANGER: 480 VOLTS shall be provided on the outside of 480-volt enclosures. The identification plate shall use white lettering on a red laminated plastic.
3. Any equipment with externally powered wiring shall be marked with a laminated plaster name plate having 3/16-inch-high white letters on a red background as follows: DANGER: EXTERNAL VOLTAGE SOURCE.
4. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic, Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic, or melamine label.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

- d. Mark equipment mounted remotely from the source of power (such as pumps and fans) with equipment number, source of power, and starter location. Where starters are remotely mounted, marking shall include equipment name, number, and location.
- e. Unless labels are provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

5. Equipment to be Labeled :

- a. Panelboards: Typewritten directory of circuits in the location provided by the panelboard manufacturer. Panelboard identification shall be engraved label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Switchboards.
- e. Transformers: Label that includes tag designation shown on the Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- f. Emergency system boxes and enclosures.
- g. Enclosed switches.
- h. Enclosed circuit breakers.
- i. Enclosed controllers.
- j. Variable-speed controllers.
- k. Push-button stations.
- l. Power transfer equipment.
- m. Contactors.
- n. Remote-controlled switches, dimmer modules, and control devices.
- o. Monitoring and control equipment.
- p. UPS equipment.

END OF SECTION

SECTION 16110

RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish and install complete raceway systems as shown on the Drawings and as specified herein.

- B. The complete above grade raceway system shall be rigid aluminum above grade and PVC-40 below grade.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. The equipment shall be products of manufacturers who are fully experienced, reputable and qualified in the manufacture of the equipment to be furnished. The system components shall be designed, constructed, delivered and installed in accordance with the best practices and methods.

B. Standards:

1. Underwriters Laboratories, Inc. (U.L.).
2. American Society for Testing and Materials, (ASTM).
3. Federal Specifications.

C. Manufacturers:

1. Non-Metallic Raceways.
 - a. Carlon.
 - b. Triangle Pipe and Tube Co.
 - c. Phillips Petroleum Co.
 - d. Indian Head Company.
 - e. Or equal.
2. Metallic Raceways:
 - a. Youngstown Sheet and Tube Co.

- b. Allied Tube and Conduit Corp.
- c. Wheeling-Pittsburg Steel Corp.
- d. Or equal.

1.03 SUBMITTALS

A. Material and Shop Drawings:

1. Copies of all materials required to establish compliance with these specifications shall be submitted in accordance with the provisions of the General Conditions. Submittals shall include at least the following:
 - a. Certified shop drawings with performance data and physical characteristics.
 - b. Descriptive literature, bulletins, and/or catalogs of each item of equipment.
 - c. All information required by Section 01300.
 - d. A complete total bill of materials for all equipment.
2. In the event that it is impossible to conform with certain details of the specifications, describe completely all non-conforming aspects of the Shop Drawing transmittal.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The specifications are intended to give a general description of what is required, but do not cover all details which may vary in accordance with the exact requirements of the equipment as offered. They are, however, intended to cover the furnishing, delivery, installation and field testing of all materials, equipment and apparatus as required. Any additional auxiliary equipment necessary for the proper operation of the proposed installation not mentioned in these specifications or shown on the Drawings shall be furnished and installed.
- B. The material covered by these specifications is intended to be standard equipment of proven ability and as manufactured by reputable concerns having experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with best practice and methods and shall operate satisfactorily when installed as shown on the Drawings.

2.02 MATERIALS AND EQUIPMENT

A. Metallic Conduit:

1. ALUM conduit shall contain less than 0.1 percent copper and conform to Federal Specification WW-C-540C.

B. Non-Metallic Conduit and Fittings:

1. PVC conduit shall be schedule 80 composed of High Impact PVC (polyvinyl chloride (C-200 Compound), and shall conform to industry standards, and be UL listed in accordance with Article 347 of National Electrical Code for underground and exposed use. Materials must have tensile strength of 55 PSI, at 70 degrees F, flexural strength of 11,000 PSI, compression strength of 8600 PSI. Manufacturer shall have five years' extruding PVC experience.
2. Liquidtight Flexible Conduit and Fittings shall be for use per Article 351 of the NEC. PVC compounds shall not include fillers. Fittings shall be manufactured from high impact PVC.

C. Liquidtight, Flexible Non-Metallic Conduit, Couplings and Fittings:

1. Liquidtight, flexible non-metallic conduit shall be all PVC conduit and manufactured by Thomas and Betts Co., K-Flex, Inc., or equal.
2. Fittings used with Liquidtight flexible conduit shall be of the non-metallic type as manufactured by the Thomas and Betts Co., Xtraflex System, K-Flex, Inc., or equal.

D. Flexible Couplings:

1. Flexible Couplings shall be as manufactured by the Thomas and Betts Co., K-Flex, Inc., or equal.

E. Conduit hubs shall be as manufactured by Myers Electric Products, Inc., Raco., Div., Appleton Electric Co., or equal.

F. Conduit wall seals shall be Type WSK as manufactured by the O.Z. Electrical Mfg. O., or equal.

G. Combination expansion-deflection fittings shall be Type XD as manufactured by the Crouse-Hinds Co., or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall be in strict accordance with the manufacturer's instructions and recommendation, in the location shown on the Drawings.
- B. No conduit smaller than 1/2-inch electrical trade size shall be used, nor any have more than three 90 degree bends in any one run. Pull boxes shall be provided as required or directed. Minimum size floor conduit shall be 3/4-inch.

- C. No wire shall be pulled until the conduit system is complete in all details; in the case of concealed work, until all rough plastering or masonry has been completed; in the case of exposed work, until the conduit system has been completed in every detail.
- D. The ends of all conduit shall be tightly plugged to exclude dust and moisture while the buildings are under construction.
- E. Conduit supports shall be spaced at intervals of 4 feet or less, as required to obtain rigid construction. Conduit straps shall be type as manufactured by "CLIC".
- F. Single conduits shall be supported by means of one-hole non-metallic pipe clamps in combination with one-screw back plates, to raise conduits from the surface. Multiple runs of conduits shall be supported on trapeze type hangers with fiberglass horizontal members and fiberglass treaded hanger rods. The rods shall be not less than 3/8-inch diameter.
- G. Conduit hangers shall be attached to structural steel by means of non-metallic beam or channel clamps. Where attached to concrete surfaces, concrete inserts of the spot type shall be provided.
- H. All conduits on exposed work shall be run at right angles to and parallel with the surrounding wall and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run perfectly straight and true.
- I. No broken run shall exceed 500 feet in length. This length shall be reduced by 75 feet for each 90 degree elbow.
- J. Conduit terminating in boxes shall have sealing double lock-nuts and insulating bushings.
- K. Conduit terminating in gasketed enclosures shall be terminated with sealing conduit hubs.
- L. Conduit wall seals shall be used for all conduits penetrating walls below grade or other locations shown on the Drawings.
- M. Liquidtight flexible metal conduit shall be used for all motor terminations and other outdoor equipment where vibration is present.
- N. Flexible couplings shall be used in hazardous locations for all motor termination and other equipment where vibration is present.
- O. Expansion fittings shall be installed in the following cases: In each conduit run wherever it crosses an expansion joint in the concrete building structure; in each conduit run which is mechanically attached to separate structures to relieve strain caused by shift on one structure in relation to the other; in straight conduit runs above ground which is more than one hundred feet long and interval between expansion fittings in such a run shall not be greater than 100 feet.

- P. PVC joints shall be solvent welded. Threads will not be permitted on PVC conduit and fittings. Installation of PVC conduit shall be in accordance with manufacturer's recommendations. PVC conduit shall not be used to support fixture or equipment. Field bends shall be made with approved hotbox. Heating with flame and hand-held dryers are prohibited.
- Q. Conduit installations on roofs shall be kept to a bare minimum. Conduit shall be supported above roof at least 6 inches using approved conduit supporting devices. Supports to be fastened to roof using roofing adhesive as approved by roofing contractor.
- R. Cables in vertical raceways shall be supported as per NEC Article 300-19. Provide and install supporting devices for cables, including any necessary accessible pullbox as required regardless if shown on drawings or not. Provide and install access panels as required. Coordinate location of pull box and access panel with the Engineer prior to installation. This includes empty raceways for future use.
- S. Provide and install pullboxes, junction boxes, fire barrier at fire rated walls, etc., as required by NEC Article 300, whether shown on drawings or not.
- T. Paint all field cut threads and coat all aluminum conduits in contact with concrete per manufactures's recommendations.
- U. Raceways which do not have conductors furnished under this division of specification shall be left with an approved nylon pullcord in the raceway.
- V. Grounding conductor shall be included in total conduit fill determining conduit sizes, even though not included or shown on drawings. Grounding conductors run with feeders shall be bonded to portions of conduit that are metal by approved ground bushings.
- W. All aluminum conduits in contact with concrete shall be coated with bitumastic paint.

END OF SECTION

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SECTION 16120

WIRES AND CABLES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish, install and test all wire, cable and appurtenances as shown on the Drawings and as hereinafter specified.

B. General Design:

1. Wire for lighting, and receptacle circuits in the administration building shall be type THHN solid.
2. Wire for all power feeder and motor circuits outside of the administration building shall be type THHN stranded.
3. Single conductor wire for control, indication and metering shall be type THHN No. 14 AWG, stranded.
4. Multi-conductor control cable shall be No. 14 AWG, stranded tinned copper.
5. Wire for process instrumentation shall be No. 16 AWG, stranded tinned copper.
6. Except for control and signal leads, no conductor smaller than No. 12 AWG shall be used.

1.02 QUALITY ASSURANCE

A. Standards:

1. Insulated Cable Engineers Association (ICEA).
2. Underwriters Laboratories, Inc. (U.L.)
3. American Society for Testing and Materials (ASTM)

B. Manufacturers:

1. 600 volt wire and cable.
 - a. Hi-Tech Cable Corp.
 - b. Collyer Insulated Wire Co.
 - c. Okonite Co.

- d. Rome Cable Co.
 - e. American Insulated Wire Corp.
 - f. Triangle PWC, Inc.. Or equal
2. Instrumentation and Control Cable:
- a. American Insulated Wire Corp.
 - b. Rome Cable Corp.
 - c. Okonite Co.
 - d. Eaton Corp. "Polyset".
 - e. Triangle PWC, Inc.
 - f. Or Equal.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All conductors shall be carefully handled to avoid kinks or damage to the insulation.
- B. All conductors stored outdoors shall be covered.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Wires and cables shall be of annealed, 98 percent conductivity, soft drawn copper conductors.
- B. All conductors shall be stranded except lighting and receptacle circuits.

2.02 MATERIALS

- A. 600 Volt Wire and Cable:
 - 1. Type THHN shall be PVC insulation with nylon jacket.
- B. Instrumentation and Control Cable:
 - 1. Process instrumentation wire shall be twisted pair, 600 volt, cross linked polyethylene insulated, aluminum tape shielded, polyvinyl chloride jacketed, type "XLP". Multi-conductor cables with individually shielded twisted pairs shall be installed where indicated.

2. Multi-conductor control cable shall be stranded, 600 volt, cross-linked polyethylene insulated with PVC jacket, type "XLP".

C. Terminations and Splices:

1. Unless otherwise indicated on the plans, no splices may be made in the cables without prior approval of the Engineer. Where splicing is approved, the splicing material shall be as recommended and approved by the cable manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All conductors shall be carefully handled to avoid kinks or damage to insulation.
- B. Lubrications shall be used to facilitate wire pulling. Lubricants shall be U.L. listed for use with the insulation specified.
- C. Shielded instrumentation wire shall be installed from terminal to terminal with no splicing at any intermediate point.
- D. Shielded instrumentation wire shall be installed in rigid steel conduit and pull boxes that contain only shielded instrumentation wire. Instrumentation cables shall be separated from control cables in manholes.
- E. Shielding on instrumentation wire shall be grounded at one end only as directed by the supplier of the instrument.
- F. Wire and cable connections to terminals, splices, and taps shall be made with compression connectors. Connections of insulated conductors shall be insulated and covered. All connections shall be made using materials and installation methods in accordance with instructions and recommendations of the manufacturer of the particular item of wire and cable. The conductivity of all completed connections shall not be less than that of the uncut conductor. The insulation resistance of all completed connections of insulated conductors shall be not less than that of the uncut conductor.
- G. All wire and cable shall be continuous and without splices between points of connection to equipment terminals, except a splice will be permitted by the Engineer if the length required between the points of connection exceeds the greatest standard shipping length available from the manufacturer specified or as approved by the Engineer.
- H. Installed, unapproved wire shall be removed and replaced at no additional cost to the Owner.
- I. Steel fish tapes and/or steel pulling cables shall not be used in PVC raceway systems.
- J. Remove debris and moisture from the conduits, boxes, and cabinets prior to cable installation and mandrel with device of one size smaller than conduit and mandrel with wire brush one size larger than conduit.

3.02 TESTS

- A. All 600-volt wire insulation shall be tested with a megohm meter after installation. Tests shall be made at not less than 1000-VDC. A cable test data form shall be provided for Engineer review.
- B. All service conductors shall be tested as in Paragraph A above. These tests shall be witnessed by the Engineer.

END OF SECTION

SECTION 16130

BOXES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. Furnish and install all junction boxes, pull boxes, service entrance boxes and for a complete raceway system as shown on the Drawings and as specified herein.

B. General Design

1. Unless otherwise hereinafter specified or shown on the Drawings, all boxes and fasteners shall be type NEMA 4X, 316-stainless steel.
2. All boxes in air conditioning plenums above ceilings shall be pressed steel.
3. All boxes that do not receive devices are to have blank plates installed matching wiring device plates.

1.02 QUALITY ASSURANCE

A. Standards

1. Underwriters Laboratories, Inc. (U.L.)
2. Federal Specifications
3. American Society for Testing and Material, (ASTM)

B. Manufacturers

1. Hoffman, Type CHNFSS
2. Or Equal

1.03 SUBMITTALS

A. Materials and Shop Drawings

1. See Section 16050 - General Provisions.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Boxes and fittings shall be stored indoors protected from damage.

1.05 WARRANTY AND GUARANTEES

- A. All boxes and fittings shall be warranted against defects or failure for a period of one year from date of acceptance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Boxes shall be constructed as follows:
 - 1. 14-gauge 316L stainless steel
 - 2. Continuously welded and ground smooth, no holes or knockouts.
 - 3. Seamless foam in-place gasket, watertight, dust-tight.
 - 4. Stainless steel screws and clamps.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All boxes shall be supported away from surfaces.
- B. All boxes shall be sized per the National Electrical Code (NEC)
- C. All conduit entries into boxes shall not lower or change the NEMA rating of the box.

END OF SECTION

SECTION 16140

WIRING DEVICES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish and install wiring devices and all necessary accessories and appurtenances required as hereinafter specified and shown on the Drawings.
2. Wiring devices shall include the following:
 - a. Wall Switches
 - b. Device Plates
 - c. Plugs
 - d. Receptacles
 - e. Lighting Control Time Clocks
 - f. Lighting Contactors
 - g. Control Stations
 - h. Ground Fault Interrupter Receptacles

B. Related Work Described Elsewhere:

1. General Provisions: Section 16050.
2. Raceway: Section 16110.

1.02 QUALITY ASSURANCE

A. Standards:

1. Underwriters Laboratories Inc. (UL).
2. National Electric Manufacturers Association (NEMA).
3. National Electrical Code (NEC).

B. Manufacturers:

1. Wall switches, device plates, plugs, and receptacles as follows:
 - a. Arrow-Hart
 - b. Bryant
 - c. Hubbell
 - d. Leviton
 - e. or Equal
2. Clocks:
 - a. Simplex
 - b. or Equal
3. Lighting Contactors:
 - a. Square-D
 - b. Cutler-Hammer
 - c. or Equal
4. Dimmer Controls:
 - a. Leviton
 - b. Prescolite
 - c. or Equal
5. Control Stations:
 - a. Hoffman Engineering Co.
 - b. Square-D
 - c. Crouse-Hinds
 - d. Or equal

1.03 SUBMITTALS

A. Material and Shop Drawings:

1. Submit material list and catalog cut-sheets for all items covered under this section. Indicate type, ratings, material, color, and manufacturer.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All devices covered under this Section shall be stored indoors, protected from damage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Switches:

1. Wall switches shall be of the indicating, toggle action, flush mounting quiet type. All switches shall conform to Federal Specification W-S-896-D.
2. Wall switches shall be of the following types and manufacturer or equal. Any reference to a specific figure number of a specific manufacturer is for the purpose of establishing a type and quality of product and shall not be considered as proprietary.
 - a. Single pole - Arrow-Hart, Catalog No. 1991.
 - b. Double pole - Arrow-Hart, Catalog No. 1992.
 - c. Three way - Arrow-Hart, Catalog No. 1993.
 - d. Four way - Arrow-Hart, Catalog No. 1994.
 - e. Single pole, key operated - Arrow-Hart Catalog No.1991-L.
 - f. Momentary contact, 2 circuit, center off - Arrow-Hart, Catalog No. 1895.
 - g. Weatherproof cover for Arrow-Hart 2900 series tap action switches - Arrow-Hart Catalog No. 2881-G.

- B. Receptacles:

1. Wall receptacles shall be of the following types and manufacturer or equal.
 - a. Single, 20A, 125V, 1P, 3W; Arrow-Hart, Catalog No 5351.
 - b. Duplex, 20A, 125V, 2P, 3W; Arrow-Hart, Catalog No. 5352.
 - c. Weatherproof, 20A, 125V, 2P, 3W; Arrow-Hart, Catalog No. 5351 and WLRD-1 cover.
 - d. Corrosion-resistant, duplex, 20A, 1 25V, 2P, 3W; Arrow-Hart, Catalog No. 5351 and WLRD-I cover.

- e. 60A, 480V, 3P, 2W; weatherproof receptacle shall be Crouse-Hinds Catalog No. ARE6324 with Crouse-Hinds Catalog No. APJ 6385 plug.
- f. Ground fault interrupter, duplex, 20A, 125V, 3P, 2W; Arrow-Hart Catalog No. GF5342.
- g. Stainless steel indoor mounting plate for G.F.I. receptacle; Arrow-Hart Catalog No. 97061.
- h. Weatherproof cover for G.F.I. receptacle in FS box; Arrow-Hart Catalog No. 4501-FS.
- i. Clock hanger, 15A, 125V, 2P, 3W; Arrow-Hart Catalog No. 452.
- j. Single, 20A, 125V, 2P, 3W; Arrow-Hart Catalog No. 8510BL; cover: Arrow-Hart Catalog No. 9301C indoor, 7420C weatherproof.
- k. Single, 30A, 125V, 2P, 3W; Arrow-Hart Catalog No. 5716N; cover: Arrow-Hart Catalog No. 9301C indoor, 7420C weatherproof.
- l. Clothes dryer, 30A, 125/250V, 3P, 3W; Arrow-Hart Catalog No. 9344N. Matching cord set shall also be included.

C. Device Plates:

- 1. Plates for flush mounted devices shall be of the required number of gangs for the application involved and shall be 302 (18-8) high nickel stainless steel of the same manufacturer as the device.

D. Lighting Contactor:

- 1. Lighting contactors shall be of the electrically operated, electrically held type in NEMA 1 enclosures of the number of poles as called for on the Drawings.
- 2. Contactors shall be rated for 25A-600 volt contacts and be similar and equal to Automatic Switch Company bulletin 1255-166 RC.

E. Lighting Control Time Switches:

- 1. Time switches for the control of lighting shall have astronomic dials, reserve power and be similar and equal to the following types:
 - a. Where time switch is indicated to be for momentary contact operation it shall be similar and equal to Intermatic Inc. Catalog No. ET-70115-C.
 - b. Where time switch is indicated for SPST maintained control it shall be similar and equal to Intermatic Inc. Catalog No. V-45471-CR.

- c. Where time switch is indicated for DPST maintained control it shall be similar and equal to Intermatic Inc. Catalog No.V-45471-CR.
- d. Where time switch is indicated for roadway or equipment, lighting shall be similar or equal to Intermatic Inc. Catalog No. ET-7000 Series.

F. Control Stations:

- 1. Control stations for start/stop pushbutton and hand-off-automatic selector switches shall be corrosion resistant, dust-tight, watertight and weatherproof, NEMA 4X, 600 VAC, UL Standard 508 as manufactured by Crouse-Hinds Series NCS or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Receptacles in process areas and shops shall be mounted 36 inches above the floor unless otherwise noted on the Drawings.
- B. Receptacles in office and other like areas shall be mounted 18 inches above the floor unless otherwise noted on the Drawings.
- C. Use bolt, screws, nuts and other threaded devices having standard threads and heads so they may be installed and replaced without special tools.
- D. Check light switch locations before rough-in to avoid installing a switch behind the door swing.
- E. The Engineer and Owner reserve the right to change any switch or receptacle location within the same room, without added cost prior to rough-in.
- F. Locate outlets intended for the supply of specific items such as water coolers, copying machines, fans, etc., as recommended by the item manufacturer.

END OF SECTION

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SECTION 16160

PANELBOARDS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish all labor, materials, equipment and incidentals required and install all panelboards as hereinafter specified and as shown on the Drawings.

1.02 QUALITY ASSURANCE

A. Standards:

1. Panelboards shall be in accordance with the Underwriter Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled where procedures exist. Panelboards shall also comply with NEMA Standard for Panelboards and the National Electrical Code.

B. Manufacturer (NEMA 1):

1. 120/240V, single phase, 3 wire, and 120/208V three phase, 4-wire panelboards shall be as manufactured by the Square D Co., or. Cutler/Hammer
2. 480V, three phase, 3-wire panelboards shall be as manufactured by the, Square D Co., I-Line or. Cutler/Hammer

C. Manufacturer (NEMA 3 and 12):

1. NEMA 3 and 12 panelboards shall be type NLP as manufactured by the Crouse-Hinds Company or equal.

1.03 SUBMITTALS

A. Materials and Shop Drawings:

1. See Section 16050 General Provisions.

PART 2 - PRODUCTS

2.01 RATING

- ###### **A. Panelboard ratings shall be as shown on the Drawings. All panelboards shall be rated for the intended voltage.**

2.02 CONSTRUCTION AREA (NEMA 1)

A. Interiors:

1. All interiors shall be completely factory assembled with circuit breakers, wire connectors, etc. All wire connectors, except screw terminals, shall be of the anti-turn solderless type and all shall be suitable for copper or aluminum wire of the sizes indicated.
2. Interiors shall be so designed that circuit breakers can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling or tapping.
3. Branch circuits shall be arranged using double row construction except when narrow column panels are indicated. Branch circuits shall be numbered by the manufacturer.
4. A nameplate shall be provided listing panel type, number of circuit breakers, ratings and source.

B. Buses:

1. Bus bars for the mains shall be of tin-plated copper. Full size neutral bars shall be included. Bus bar taps for panels with single pole circuit devices shall be arranged for sequence phasing of the branch circuit devices. Bussing shall be braced throughout to conform to industry standard practice governing short circuit stresses in panelboards. Phase bussing shall be full height without reduction. Cross connectors shall be copper.
2. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection.
3. Spaces for future circuit breakers shall be bussed for the maximum device that can be fitted into them.

C. Boxes:

1. Recessed boxes shall be made from galvanized code gauge steel without multiple knockouts. Surface mounted boxes shall be painted to match the trim. Boxes shall be of sufficient size to provide a minimum gutter space of 4 inches on all sides.
2. Surface mounted boxes shall have an internal and external finish as hereinafter specified in Paragraph D4.
3. At least 4 interior mounting studs shall be provided.
4. All conduit entrances shall be field punched.

D. Trim:

1. Hinged doors covering all circuit breaker handles shall be included in all panel trims.
2. Doors shall have semi flush type cylinder lock and catch, except that doors over 48 inches in height shall have a vault handle and 3-point catch, complete with lock, arranged to fasten door at top, bottom and center. Door hinges shall be concealed. Two keys shall be supplied for each lock. All locks shall be keyed alike; directory frame and card having a transparent cover shall be furnished on each door.
3. The trims shall be fabricated from code gauge sheet steel.
4. All exterior and interior steel surfaces of the panelboard shall be properly cleaned and finished with ANSI Z55.1, No. 61 light gray paint over a rust-inhibiting phosphatized coating. The finish paint shall be of a type to which field applied paint will adhere.
5. Trims for flush panels shall overlap the box by at least 3/4 inch all around. Surface trims shall have the same width and height as the box. Trims shall be fastened with quarter turn clamps.

2.03 CONSTRUCTION (NEMA 4X)

A. Interiors and Buses:

1. Interiors and buses shall be as hereinbefore specified for NEMA 1 construction.
2. Interior trim shall be complete. No exposed wiring allowed.

B. Boxes and Covers:

1. Boxes and covers shall be made from stainless steel.
2. Boxes and covers shall be hinged together and gasketed. All metallic parts on exterior shall be stainless steel.
3. Conduit openings shall be sealed with lock rings or sealing washers.
4. Polycarbonate or plastic enclosures or boxes are unacceptable.

2.04 CIRCUIT BREAKERS

- A. Panelboards shall be equipped with circuit breakers with frame size and trip settings as shown on the Drawings.
- B. Circuit breakers shall be molded case, bolt-in type, for NEMA 1 and plug-in for NEMA 4X.

- C. Circuit breakers used in 120/240 and 120/208V panelboards shall have an interrupting capacity of not less than 22,000 amperes, RMS symmetrical.
- D. Three pole breakers used in 480V panelboards shall have an interrupting capacity of not less than 25,000 - amperes, RMS symmetrical.
- E. GFCI:
 - 1. GFCI (ground fault circuit interrupter) shall be provided for circuits where indicated on the Drawings. GFCI units shall be 1 pole, 120 volt, molded case, bolt-on breakers, incorporating a solid state ground fault interrupter circuit insulated and isolated from the breaker mechanism. The unit shall be U.L. listed Class A Group I device (5 milliamp sensitivity, 25 millisecond trip time), and in interrupting capacity of 10000 amperes RMS.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Boxes for surface mounted panelboards shall be mounted so there is at least 1/2 inch air space between the box and the wall.
- B. Unless otherwise noted on the Drawings, top of cabinets shall be mounted 6-feet 0-inch above the floor, properly aligned and adequately supported independently of the connecting raceways.
- C. All wiring in panelboards shall be neatly formed, grouped, laced and identified to provide a neat and orderly appearance. A typewritten directory card identifying all circuits shall be placed in the card holder inside the front cover.

END OF SECTION

SECTION 16170

SAFETY SWITCHES

PART I- GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish and install all motor and circuit disconnects as hereinafter specified and as shown on the drawing.

B. General Design:

1. All switches shall be heavy duty and have stainless steel NEMA 4X enclosures and be horsepower rated.
2. All switches shall have metal nameplates, front cover mounted, that contain a permanent load, switch-type, catalog number and HP ratings, handle whose position is easily recognizable and is padlockable in the "off" position, visible blades, reinforced fuse clips, nontearable, positive, quick make-quick break mechanism, switch assembly plus operating handle as an integral part of the enclosure base.
3. Switches shall have defeatable door interlocks that prevent the door from opening when the operating handle is in the "on" position. All switches shall have line terminal shields.
4. All current carrying parts shall be copper.
5. Auxiliary contacts rated 10 ampere at 240 volts shall be provided, for motor space heater interlock and position indication.

1.02 QUALITY ASSURANCE

A. Standards:

1. National Electrical Manufacturer's Association (NEMA).
2. Underwriter's Laboratories (UL).
3. Federal Specifications.
4. National Electrical Code (NEC).

B. Manufacturer:

1. Switches shall be as manufactured by Square D Co. Class 9422, Cutler-Hammer, or equal.

1.03 SUBMITTALS

- A. Materials and Shop Drawings:
 - 1. See Section 16050 - General Provisions.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All switches shall be stored indoors protected from damage.

1.05 WARRANTY AND GUARANTEES

- A. All switches shall be warranted against defect, rusting or failure for a period of one year from date of acceptance.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Where a six (6) pole weatherproof disconnect are called for on the drawings; the Contractor shall provide two (2) 600 Volt, 3-pole non-fusible switch in a single NEMA 4X stainless steel enclosure with a single operating handle mechanically interlocked to both disconnects.
- B. All parts exposed to the weather or in hose down areas shall be stainless steel.
- C. Short circuit rating - 10,000 RMS symmetrical amperes for non-fused switches.
- D. Line and load lugs shall be front removable and suitable for copper, 60/75 degree C wire through 200A sizes, 75 degree C wire for 400-800A sizes.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All switches shall be mounted as shown on the drawings.
- B. Location of disconnect switches shall be per the N.E.C. and shall be verified with the Engineer before installation.
- C. All mounting appurtenances shall be 316 stainless steel including fasteners.

END OF SECTION

SECTION 16216

DIESEL ENGINE DRIVEN GENERATOR

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. Furnish all labor, materials, and incidentals required to install, put into operation, and field test the Owner furnished diesel engine driven generator unit and appurtenances as shown on the Drawings and specified herein and per Table 16216-1.

Location	Size (kW/kVA)	Fuel Tank Size (Gal)
Plant	1000/1250	5000

2. These performance Specifications are intended to give a general description of what is required, but do not cover all details which will vary in accordance with the requirements of the equipment as offered. It is, however, intended to cover the furnishing, complete installation, and field testing, of all materials, equipment and appurtenances for the complete units as herein specified, whether specifically mentioned in these Specifications or not.
3. For all units there shall be furnished and installed all necessary and desirable accessory equipment and auxiliaries whether specifically mentioned in these Specifications or not. This installation shall incorporate the highest standards for the type of service including field testing of the entire installation and instruction of the regular operating personnel in the care, operation and maintenance of all equipment.
4. The generator unit shall be mounted as shown on the Drawings and shall be arranged for automatic starting and stopping, and load transfer upon failure of the normal source of power.

1.03 SUBMITTALS

A. Materials and Shop Drawings

1. Submit to the Engineer for approval installation drawings with pad dimensions and mean of anchoring. The mounting of the generator shall be approved by a Florida registered structure engineer.

1.04 PRODUCT, STORAGE AND HANDLING

- A. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation.
- B. All equipment and parts must be properly protected against any damage during a prolonged period at the site.
- C. Factory assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.
- D. Finished surface of all exposed openings (exhaust, etc.) shall be protected by wooden blanks, strongly built and securely bolted thereto.
- E. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.
- F. Proper care shall be taken to protect parts from the entrance of water during shipment, storage, and handling.
- G. Each box or package shall be properly marked to show its net weight in addition to its contents.

PART 2 - PRODUCTS

2.01 Not Required.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The equipment manufacturer shall furnish the services of a competent and experienced representative who has complete knowledge of proper operation and maintenance of the equipment for period of not less than one (1) day to inspect the installed equipment, supervise the initial test run, and to provide instructions to the plant personnel. The visit will be for checking and inspecting the equipment after it is installed and shall be allocated solely to the instruction of plant personnel in operation and maintenance of the equipment. This instruction period shall be scheduled at least ten days in advance with the Owner and shall take place prior to plant start-up and acceptance by the Owner. The final six (6) copies of operation and maintenance manuals must have been delivered to the Engineer prior to scheduling the instruction period with the Owner.
- B. The Contractor shall install suitable jacket water additives, including antifreeze, as furnished by the engine manufacturer and approved by the Engineer, for prevention of both scale formation and corrosion in the water jackets and cooling system components which are in contact with the engine jacket water. These additives shall be added to the cooling system prior to running the field acceptable test.

- C. The Contractor shall install the complete exhaust system, together with the silencer, the piping and insulation, and the complete supporting system. Where the exhaust passes through the roof there shall be furnished and installed suitable "rain skirt."

3.02 PAINTING

- A. The engine generator set and associated equipment shall be shop primed and finish coated in accordance with the manufacturer's standard practice prior to shipment.

3.03 INSPECTION AND TESTING

- A. Prior to acceptance of the generator set all equipment furnished hereunder shall be tested to show it is free of any defects and the generator set can operate satisfactorily under full load test using resistance type load banks for 4-hours (brine tanks not acceptable). Any defects that become evident at this time shall be corrected before acceptance.
- B. Owner will not provide fuel for testing.

END OF SECTION

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SECTION 16250

AUTOMATIC TRANSFER SWITCH

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Install two (2) Owner furnished automatic transfer switch including all appurtenances required as shown on the Drawing and specified herein.

1.04 PRODUCT STORAGE AND HANDLING

- A. The equipment shall be stored indoors in a dry location at all times.
- B. The equipment shall be maintained in an upright position at all times. Lifting shall be only at the floor sills or the top mounted lifting angles.
- C. The equipment shall be protected against damage at all times. Any damage to the paint shall be carefully repaired using touch-up paint furnished by the ATS Manufacturer.
- D. Each box or package shall be properly marked to show its net weight in addition to its contents.

PART 2 - PRODUCTS

2.01 AUTOMATIC TRANSFER SWITCH

- A. Not Required

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The equipment manufacturer shall furnish the services of a competent and experienced representative who has complete knowledge of proper operation and maintenance of the equipment for period of not less than one (1) day to inspect the installed equipment, supervise the initial test run, and to provide instructions to the plant personnel. The visit will be for checking and inspecting the equipment after it is installed and shall be allocated solely to the instruction of plant personnel in operation and maintenance of the equipment. This instruction period shall be scheduled at least ten days in advance with the Owner and shall take place prior to plant start-up and acceptance by the Owner. The final six (6) copies of operation and maintenance manuals specified in Section 01730 must have been delivered to the Engineer prior to scheduling the instruction period with the Owner. These services may be combined with those provided under Article 1.06, Operating Instructions.

3.02 INSPECTION AND TESTING

- A. Prior to acceptance of the automatic transfer switch all equipment furnished hereunder shall be tested to show it is free of any defects.

END OF SECTION

**SECTION 16370
VARIABLE SPEED DRIVES**

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. Furnish and install variable speed drives including all appurtenances required as shown on the drawing and specified herein.
2. All equipment and accessories shall have approved manufacturer's shop drawings prior to installation and shall be tested in conformance with these Performance Specifications prior to acceptance and final payment by the Owner.

B. Related Work Described Elsewhere

1. Equipment: Division 11, Equipment.

1.02 QUALITY ASSURANCE

- A. Variable speed drives shall be sufficient size for the duty to be performed and shall not exceed their full-rated capacity when the driven equipment is operating as specified. Variable speed drives driving pumps shall not be overloaded under any operating condition of the pump.

B. Standards

1. National Electrical Manufacturers Association (NEMA).
2. Institute of Electrical and Electronics Engineers, Inc. (IEEE).
3. American National Standards Institute (ANSI).
4. National Electric Code (NEC).

- C. The variable frequency control shall operate satisfactorily when connected to a bus supplying other solid-state power-conversion equipment which may be causing up to 10% total harmonic voltage distortion and commutation. ASDs shall meet requirements as outlined in the latest edition of IEEE-519 for total harmonic voltage and current distortion. Individual or simultaneous operation of the ASDs shall not add more than 5% total harmonic voltage distortion to the normal bus, nor more than 10% while operating from standby generator. The

point of common coupling shall be the secondary side of the service transformer. Twelve-pulse (minimum) harmonic rectifier technology are required to meet these requirements, it is the responsibility of the VFD manufacturer to provide this harmonic technology within the VFD enclosure.

- D. The controller shall be subject to, but not limited to, the following quality assurance controls, procedures and tests:
 - 1. Power transistors, SCRs, and diodes shall be tested to ensure correct function and highest reliability.
 - 2. All printed circuit boards shall be tested at 50 degree C for 50 hours. The VFD manufacturer shall provide certification that the tests have been completed.
 - 3. Every controller will be functionally tested with a motor to ensure that if the drive is started up according to the instruction manual provided, the unit will run properly.
 - 4. The VFD systems shall be fabricated by the same VFD manufacturer, items must not be fabricated in whole or in part by parties other than the VFD manufacturer. Third-party distributor or packager modifications to a standard product will not be allowed.
 - 5. The VFD shall be fully designed and manufactured in the United States of America.
- E. Approved Manufacturers
 - 1. Danfoss

1.03 DRIVE MANUFACTURES'S RESPONSIBILITIES

- A. The VFD manufacturer shall be responsible for the installation, testing and start-up of each drive.
- B. The VFD manufacturer shall be responsible for the coordination of the drive with thier respective motor specfied in other Sections of the Project Specifications.
- C. The VFD manufacturer shall be, at no additional cost to the Owner, responsible for mitigating any harmonic, and/or all RF and/or EMI and/or any electrical type noise created by the drive which adversely affect the proper operation of any and all electronic and/or electrical power and/or mechanical devices on this project.

- D. The VFD manufacturer shall provide input and/or output filters and/or any other accessories on each drive to mitigate all electrical and mechanical noise to a limit which is not detrimental to the motor winding irregardless of the motor lead length and/or type of conduit or charecteristics to this installation.
- E. The VFD manufacturer shall be responsible for all additionnal cost related to the installation of the drive that is above and beyond the scope of work shown on the drawings and specification.
- F. The VFD manufacturer shall pay for all engineering fees and Owner costs related to the services required by the Consultant and Owner to assist in the mitigation of VFD-related problems.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. The equipment shall be maintained in an upright position at all times. Lifting shall be only at the floor sills or the top mounted lifting angles.
- B. The equipment shall be protected against damage at all times. Any damage to the paint shall be carefully repaired using touch-up paint furnished by the VFD Manufacturer.
- C. Each box or package shall be properly marked to show its net weight in addition to its contents.

PART 2 PRODUCTS

2.01 VARIABLE FREQUENCY ADJUSTABLE SPEED DRIVES (VARIABLE TORQUE, PWM)

- A. General
 - 1. The variable frequency drive (VFD) motor controller shall convert 460-Volt, three-phase, 60 Hertz utility power to adjustable voltage (0-460V) and frequency (0-60 Hz.) three-phase, AC power for stepless motor speed control with a capability of 10:1 speed range. All general options and modifications shall mount within the standard adjustable frequency controller enclosure.
 - 2. The adjustable frequency controller shall be a space vector sine-coded Pulse-Width Modulated (PWM) design. Modulation methods which incorporate "gear-changing" techniques are not acceptable. Distributor or packager modifications to a third-party standard product will not be

allowed. All drives shall be manufactured by a single manufacturer, and shall be of the same technology.

3. The controller(s) shall be suitable for use with any standard configuration squirrel-cage induction motor(s) having a 1.05 or better service factor, or with existing standard squirrel-cage induction motor(s) with nameplate data as shown on the plans. At any time in the future, it shall be possible to substitute any standard motor (equivalent horsepower, voltage and RPM) in the field.
4. The Contractor shall be responsible for the erection, installation and start up on the equipment covered by this Specification.
5. Complete drawings shall be furnished for approval before proceeding with manufacture and shall consist of master wiring diagrams, elementary or control schematics including coordination with other electrical control devices operating in conjunction with the Adjustable Frequency Drive, and suitable outline drawings with sufficient details for locating conduit stub-ups and field wiring.
6. The Adjustable Frequency Drive manufacturer shall maintain and staff engineering service and repair shops throughout the United States, including the State of Florida, trained to do start up service, emergency service calls, repair work, service contracts and training of customer personnel.

B. Construction

1. Each Adjustable Frequency Drives shall consist of a 460V, 6-pulse minimum rectifier and adjustable frequency inverter with features, functions and options as specified.
2. The controller shall produce an adjustable AC voltage/frequency output. It shall have an output voltage regulator to maintain correct output V/Hz. despite incoming voltage variations.
3. The controller shall have a continuous output current rating of 100% of motor nameplate current.
4. The VFD shall be of the Pulse-Width Modulated type and shall employ a 6-pulse (minimum) dual full-wave diode bridge converters to convert incoming fixed voltage/frequency to a fixed DC voltage, all components for 12-pulse converters must be integral to VFD enclosure and require no additional installation costs. The Pulse Width Modulation strategy shall be of the space vector type implemented in a microprocessor which generates a sine-coded output voltage.

5. The inverter output shall be generated by Insulated Gate Bipolar Transistors (IGBT) which shall be controlled by six identical base driver circuits. The VFD shall not induce excessive power losses in the motor. The worst case RMS motor line current measured at rated speed, torque and voltage shall not exceed 1.05 times the rated RMS motor current for pure sine wave operation.
6. The Adjustable Frequency Drives shall be rated for the HP, full load amperes and rpm of the motor. They shall be designed to provide continuous speed adjustment of three-phase motors. The Adjustable Frequency output voltage shall provide constant volts-per-Hertz excitation to the motor terminals up to 60 Hertz.
7. Controllers shall be rated for an ambient temperature of 0°C. to 40°C., an altitude of up to 3,300 feet above sea level and humidity of 0 to 95% non-condensing.
8. Controller enclosures shall be NEMA Type I floor-mounted, force ventilated above 25 HP. The inverters shall have complete front accessibility with easily removable assemblies.
9. The door of each power unit shall include a "POWER ON light, a VFD fault light, a VFD run light, stop push-button, start push-button, a fault reset push-button, a "HAND-OFF-AUTOMATIC" selector switch, and a manual speed control potentiometer.
10. The VFD shall be software programmable to provide automatic restart after any individual trip condition resulting from either overcurrent, overvoltage, undervoltage, or overtemperature. For safety, the drive shall shut down and require manual reset and restart if the automatic reset/restart function is not successful within a maximum of three attempts within a short time period.
11. A speed droop feature shall be included which reduces the speed of the drive on transient overloads. The drive is to return to set speed after transient is removed. If the acceleration or deceleration rates are too rapid for the moment of inertia of the load, the drive is to automatically compensate to prevent drive trip.
12. Automatic restart after drive trip or utility failure. Software selectable if not desired.

13. Process signal inverter. Software selectable to allow speed of drive to vary inversely with input signal.
14. Proportional and integral setpoint process controller with menu driven selection and programming via door-mounted keypad.
15. Pick up a spinning load. The VFD shall be able to determine the motor speed and resume control of a motor which is spinning in either direction without tripping.
16. A door-mounted membrane keypad with integral 2-line, 24-character LCD display shall be furnished, capable of controlling the VFD and setting drive parameters, and shall include the following features:
17. The digital display must present all diagnostic message and parameter values in English engineering units when accessed, without the use of codes.
18. The keypad module shall contain a "self-test" software program which can be activated to verify proper keypad operations.
19. The digital keypad shall allow the operator to enter exact numerical settings in English engineering units. A plain English user menu shall be provided in software as a guide to parameter setting, (rather than codes). Drive parameters shall be factory set in EEPROM and resettable in the field through the keypad. Six (6) levels of password security shall be available to protect drive parameters from unauthorized personnel. The EEPROM stored drive variables must be able to be transferred to new boards to reprogram spare boards.
 - a. Normally the digital display shall simultaneously display:
 - (1) Speed demand in percent.
 - (2) Output current in amperes.
 - (3) Frequency in hertz.
 - (4) Control Mode: Manual/Automatic.
 - (5) Total three-phase KW or output volts.
20. The controller shall include the following protective features:
 - a. Single phase fault or 3-phase short circuit on VFD output terminals without damage to any power component.

- b. Static instantaneous overcurrent and overvoltage trip with inverse overcurrent protection.
- c. Static overspeed (overfrequency) protection.
- d. Line or fuse loss and undervoltage protection.
- e. Power unit overtemperature protection.
- f. Electronic motor overload protection.
- g. Responsive action to motor winding temperature detectors or thermostatic switches.
- h. LED status indicators on regulator, printed circuit board face plates.
- i. Isolated operator controls.
- j. Input line fuses.
- k. Be insensitive to incoming power phase sequence.
- l. Have desaturation circuit to drive inverter section transistor base current to zero in event of controller fault.
- m. Have DC bus discharge circuit for protection of operator and service personnel with an indicator lamp.
- n. Input line noise suppression with line reactor.

21. The following system configuring settings shall be provided, without exception, field adjustable through the keypad/display unit or via the serial communication port only.

- a. Motor Nameplate Data:
 - (1) Motor frequency.
 - (2) Number of poles.
 - (3) Full load speed.
 - (4) Motor volts.
 - (5) Motor full load amps.
 - (6) Motor KW.
 - (7) Current min.
 - (8) Current max.
- b. ASD Limits:

- (1) Independent accel/decel rates.
- (2) No load boost.
- (3) Vmin, Vmax, V/Hz.
- (4) Full load boost.
- (5) Overload trip curve select (Inverse or Constant).
- (6) Min./max. speed (frequency).
- (7) Auto reset for load or voltage trip select.
- (8) Slip compensation.
- (9) Catch-A Spinning-Load select.
- (10) Overload trip time set.

c. ASD Parameters:

- (1) Voltage loop gain.
- (2) Voltage loop stability.
- (3) Current loop stability.

d. Controller Adjustments:

- (1) PID control enable/disable.
- (2) Setpoint select.
- (3) Proportional band select.
- (4) Reset time select.
- (5) Rate time select.
- (6) Input signal scaling.
- (7) Input signal select (4-20mA/0-5 Volts).
- (8) Auto start functions: On/Off, Delay On/off, Level Select On/Off.
- (9) Speed Profile: Entry, Exit, Point Select.
- (10) Min., Max. Speed Select.

- 22. The VFD shall include a comprehensive microprocessor based digital diagnostic system which monitors its own control functions and displays faults and operating conditions. microprocessor systems must be products of the same manufacturer as the ASD.
- 23. A "FAULT LOG" shall record, store, display and print upon demand, the following for the 10 most recent events:

- a. ASD mode (Auto/Manual).
 - b. Elapsed time (since previous fault).
 - c. Type of fault.
24. The fault log record shall be accessible via a RS232 serial link as well as line by line on the keypad display.
25. The following factory installed modifications shall be furnished with the controller:
- a. Input circuit breaker, interlocked with the enclosure door, with through-the-door handle to provide positive disconnect of incoming AC power. The circuit breaker shall be rated for 65,000 AIC.
 - b. Door-mounted meters or keypad display shall be provided on all units as follows:
 - (1) Analog or digital ammeter (0–110%).
 - (2) Analog or digital speed/frequency meter (0–110% speed as well as Hz.).
 - (3) Analog or digital voltmeter (0–600 VAC).
 - (4) Analog or digital KW meter(0–110%).
 - (5) 5-digit elapsed time meter.
 - (6) HAND-OFF-REMOTE Selector Switch
 - c. The drive is to be provided with isolated 4-20mA DC output signals proportional to speed and current for remote monitoring of the ASD.
 - d. Relay output auxiliary contacts to indicate the position of all selector switches, drive failures and drive status.
 - e. Provide 120VAC and logic for motor space heater control.
 - f. Provide control of remote seal water solenoids
 - g. Provide for motor t-stat shut down.
 - h. Input line reactor within enclosure.

- i. Output motor long lead dv/dt filter with enclosure.
- j. Ethernet I/P interface card for remote SCADA

PART 3 EXECUTION

3.01 SYSTEM OPERATION

- A. With the VFD H-O-R switch in the "HAND" position and the local START position, the drive shall start at minimum speed and adjust per a potentiometer.
- B. With the VFD H-O-R switch in the "OFF" position the drive shall not start under any condition.
- C. With the VFD H-O-R switch in the "REMOTE" position, the drive shall be controlled via the remote PLC.

3.02 INSTALLATION

- A. Field wiring shall be per manufacturer's recommendation.
- B. The manufacturer shall include in his bid one (1) normal work day per drive of a qualified service engineer's time. This time will be used to ensure proper connection and functioning of the equipment prior to startup and to train Owner personnel in the use of the equipment.
- C. The manufacturer shall provide one spare for each type of plug-in type PC card. These spares will be color-coded or otherwise keyed to its original counterpart. In addition to the cards, the manufacturer shall provide two spares per drive all expendable items such as fuses, pilot lamps, etc.

3.03 INSPECTION AND TESTING

- A. The drive manufacturer shall test the drive controller with a motor load prior to shipment.
- B. The drive manufacturer shall furnish a certified field test report demonstrating installed compliance for voltage and current distortion at the required point of common coupling under both utility power and generator power. The test shall report shall be sealed by a Florida-Registered Professional Electrical Engineer.

- C. A copy of all tests and checks performed in the field, complete with meter readings and recordings, where applicable, shall be submitted to the Owner.

END OF SECTION

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SECTION 16402

UNDERGROUND SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. Furnish and install a complete underground system of ducts, manholes and handholes all as hereinafter specified and shown on the Drawings.

B. Related Work Described Elsewhere

1. Excavation and backfilling is included in Division 2.
2. All concrete and reinforcing steel shall be included under Division 3.
3. Conduit for ducts shall be as specified under Section 16110.
4. Ground rods and other grounding materials and methods shall be as specified under other sections of Division 16.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Ducts shall be encased in concrete as indicated on the plans.
- B. Cable racks, supports, pulling-in irons, manhole steps, and hardware shall be galvanized steel manufactured by Cope or equal.
- C. Precast manholes and handholes shall be heavy duty type, designed for a Class H20 wheel load. Precast manholes and handholes shall be as manufactured by Brooks Products Co.
- D. Handhole covers and frames shall be as shown on the Drawings.
- E. Fireproofing tape shall be Irvington No. 7700 or be an approved equal product.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Ducts shall be installed to drain away from buildings; ducts between manholes or handholes shall drain toward the manholes or handholes. Duct slopes shall not be less than 3 inches per 100 feet.
- B. Duct banks shall be reinforced as shown on the Drawings.
- C. Duct lines shall be laid in trenches on a clean backfill bedding not less than 6 inches thick and well graded.
- D. Plastic spacers shall be used to hold ducts in place. Spacers shall provide not less than 2-inch clearance between ducts.
- E. The minimum cover for duct lines shall be 24 inches unless otherwise permitted by the Engineer.
- F. Duct entrances to buildings and structures shall be made with steel conduit not less than 10 feet long.
- G. PVC duct termination at manholes shall be with PVC end bells. Steel conduits shall be terminated with insulated, grounding-type bushings.
- H. Where bends in ducts are required, long radius elbows, sweeps and offsets shall be used.
- I. All ducts shall be rodded and a mandrel drawn through followed by a swab to clean out any obstructions which may cause cable abrasions. The mandrel shall be 12 inches in length and the diameter 1/2 inch less than the inside diameter of the duct.
- J. Spare ducts shall be plugged and sealed watertight at all manholes, buildings and structures.
- K. Ducts in use shall be sealed watertight at all manholes, buildings and structures.
- L. Pulling-in irons shall be installed opposite all duct entrances to manholes, equal to Cope Catalog No. 311-9.
- M. Cable racks shall be similar and equal to Cope Catalog 324-T, cut to length for one, two, three or four vertical tiers of cables. Racks shall be mounted with 1/2-inch by 4-inch expansion bolts on manhole walls. Arms similar and equal to Cope Catalog No. 325-T4, 325-T75 and/or 325-T10 for one, two and/or three cables, respectively, shall be furnished and installed with Catalog No. 326-T22 porcelain insulators for support of cables. Lock clips shall be furnished and installed to secure hooks in position.
- N. Cables shall be trained in manholes and supported on racks and hooks at intervals not greater than 3 feet - 0 inches and supports shall be installed on each side of all splices. Furnish inserts on all manhole walls for mounting future racks as well as racks

required for present installation. Branch circuit conductors shall not be run in manholes.

- O. Fireproofing shall be furnished for all 5-KV cables in manholes. Each individual 5-KV cable shall be wrapped with an arc-proofing tape. The tape shall be applied in accordance with the manufacturer's recommendations. The wrapping shall extend into the end bells.
- P. Aluminum rigid conduit shall be used for risers.
- Q. All risers from underground shall be given a heavy coat of bitumastic paint from a point 1 foot - 0 inches below grade to a point not less than 6 inches above grade or surface of slab.
- R. All joints shall be made so as to prevent the passage of concrete inside the conduit to form obstructions or cause cable abrasions.
- S. Manhole covers in streets shall finish flush with finished paving and in other areas shall finish 3 inches above crown of adjacent roadway. Floor elevations of manholes shall be so set that the center line of the lowest conduit entering will be not less than 1 foot above the floor and center line of the highest conduit entering will be not less than 1 foot below the roof slab.
- T. Concrete monuments shall be provided at each stubbed conduit location. Monuments shall be as shown on the Drawings and shall be installed in the same manner outlined for manhole covers.
- U. A #6 bare copper wire (stranded) shall be installed in each 4-inch PVC conduit.
- V. A 5/8-inch by 10-foot copper clad ground rod shall be driven in the bottom of each manhole. All bond wires and galvanized steel conduits shall be bonded to the ground rod.

END OF SECTION

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SECTION 16445

TRANSIENT VOLTAGE SURGE SUPPRESSION

PART 1 - GENERAL

This section specifies internal mounted transient voltage surge suppression (TVSS) for electrical equipment as service entrance equipment, switchgear, switchboards, motor control centers, and panelboards.

Provide as per the same criteria specified herein for external TVSS where indicated on the drawings and with enclosures specified or indicated.

1.01 DESCRIPTION

A. SCOPE:

Provide TVSSs for service entrance equipment, switchgear, switchboards, motor control centers, and panelboards specified in the Division 16 electrical distribution equipment specification sections or indicated on the Drawings.

Provide TVSS with the same voltage, phase, 3 or 4 wire system as the equipment that the unit is protecting and with the specified ratings to protect the host electrical equipment.

B. EQUIPMENT LIST:

Item	Equipment No.
Motor Control Center	
Panelboard	
Switchboard	
Switchgear	

C. OPERATING CONDITIONS:

Verify the project conditions for seismic zone, elevation, ambient temperature, corrosive atmosphere, and humidity.

D. PERFORMANCE REQUIREMENTS:

TVSS performance parameters required:

1. National Electrical Code (NEC) Section 285.2 and 285.6:
 - a. Limit transient voltage by diverting or limiting surge current.
 - b. Prevent continued flow of current following transient event while remaining capable of repeating these functions.

- c. Utilize fuses with repetitive surge capability to survive specified surge rating and meet UL 1449.
 - d. Marked with a short circuit current rating and not installed where the available fault current (AIC rating) is in excess of that rating.
2. UL 1449 stipulation for fused TVSS:
- a. Certify that the TVSS system conforms to UL 1449 2nd Edition.
 - b. Indicate the type of internal or external fusing.
3. Maximum clamping voltage:

Service voltage	Phase and wire	L-N	L-G	N-G
120 / 240V	1Φ 3W	400	400	400
240 / 120V	3Φ 4W	400/700	400	400/700
208Y / 120 V	3Φ 4W	400	400	400
240V	3Φ 3W	NA	800	NA
480Y / 277V	3Φ 4W	800	800	800
480V	3Φ 3W	NA	1500	NA

E. DESIGN REQUIREMENTS:

- 1. TVSS equipment enclosure shall match the host electrical equipment NEMA-Type enclosure.
- 2. TVSS equipment shall provide the following local monitoring features:
 - a. Local status and alarm monitoring.
 - b. Digital surge event counter with battery back-up; alkaloid batteries are not acceptable.
- 3. TVSS equipment shall provide the following local monitoring features where specified or indicated on the drawings:
 - a. Status and alarm dry contacts for remote monitoring.
 - b. Audible alarm with alarm disable switch.
 - c. Field adjustable sensitivity

1.02 QUALITY ASSURANCE

A. REFERENCES:

This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids).

If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued.

Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
Underwriters Laboratories 1449 2nd Edition	Transient Voltage Surge Suppressors
Underwriters Laboratories 1283 3rd Edition	Electromagnetic interference filter for noise attenuation
MIL STD 220A, Rev A, Change Notice #2	Method of Insertion Loss Measurement
National Electrical Code 2002 Article 285 and Article 250.56	TVSS Installation practice and Grounding
NEMA LS-1-1992	National Electrical Manufacturers Association: Low Voltage Surge Protective Devices
CUL	Canadian Underwriters Laboratories
ANSI/IEEE C62.41 1991 and C62.45-1992	American National Standards Institute/Institute of Electrical and Electronic Engineering Inc.
Underwriters Laboratories 67	Listing for internal panelboard TVSS
Underwriters Laboratories 891	Dead Front Switch boards

B. TESTING BY 3RD PARTY:

Certify that TVSS furnished have passed the following tests per NEMA LS-1-1992:

1. The TVSS device is repetitive surge current capacity tested utilizing a 1.2x50ms, 20kV open circuit voltage, 8x20ms, 10kA short circuit Category C3 test waveform at one minute intervals with less than 5% degradation of components.
 - a. TVSS at service entrance: 20,000 Category C3 impulses
 - b. TVSS at distribution: 5,000 Category C3 impulses
2. The rating shall be based on testing of a complete TVSS unit including fuses and all components that make up the TVSS system are expressed per mode.
3. The fusing system shall be capable of allowing the rated maximum surge current to pass through without fuse operation. Systems utilizing a fusing system that opens below the maximum surge current level are unacceptable. The fusing system shall use thermal fuses and surge rated fuses, which shall be included in the surge current testing.
4. Use of plug-in modules, printed circuit boards in surge current-carrying paths, gas discharge devices or selenium rectifiers is unacceptable.
5. The maximum Continuous Operating Voltage (MCOV) for all voltage configurations shall be 115% of nominal.
6. The use of electronic grade MOV's is not acceptable. Systems using gas tubes, silicon avalanche diodes, selenium rectifiers, or printed circuit board technology in surge current path are not acceptable.

C FACTORY TESTING

TVSS shall be factory tested prior to shipment.

D. SHIPMENT, PROTECTION, AND STORAGE:

Ship the TVSS components with the electrical equipment in accordance with the requirements specified in Section 01610 and protect the equipment from damage, dirt, dust, rain, and other elements.

E. WARRANTY:

Provide a product warranty for a period of not less than five (5) years from date of installation. Warranty shall cover replacement of TVSS during the warranty period if operation of TVSS does not meet manufactures guide specification performance criteria and the requirements specified in this Section 16445. In addition to the warranty submitted as required in paragraph 16445-2.05, provide a copy of the warranty inside of each TVSS enclosure.

1.03 SUBMITTALS

Submittals and transmittal procedures for submittals are defined in Section 01300. Submittals should be required for the following conditions:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks shall denote full compliance with a paragraph as a whole.
2. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications.
3. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
4. A copy of the contract document control diagrams and process and instrumentation diagrams relating to the submitted equipment, with addendum updates that apply to the equipment in this section, marked to show specific changes necessary for the equipment proposed in the submittal. If no changes are required, the drawing or drawings shall be marked "*no changes required*". Failure to include copies of the relevant drawings with the submittal shall be cause for rejection of the entire submittal with no further review."
5. Drawings: Electrical and mechanical drawings shall be provided by the manufacturer which show unit dimensions, weights, mounting provisions, connection notes, wire size and wiring diagram.
6. Installation instructions: Clearly state rating of an overcurrent device to maintain the system's UL 1449 listing.

PART 2-PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The TVSS shall be 7 modes (connection paths) of protection using metal oxide varistors (MOV) technology; tested by UL (1449, 2nd Ed) Suppressed Voltage Rating (SVR).

- B. Primary transient paths shall utilize copper wire, aluminum bus bar and lugs of equivalent capacity to provide equal impedance interconnection between phases. No plug-in module or components shall be used in surge current carrying paths.
- C. Each protection module shall have a visual indicator that signifies that each phase is on line. The unit shall not be taken off-line to verify integrity of system. Redundant status indicators shall be mounted on the front of the door that monitors the system protection circuitry.
- D. Replaceable modules are not acceptable. TVSS will be replaced in the event a phase indicating light has extinguished, alarm annunciation with the service alarm light on.
- E. The TVSS device EMI-RFI noise rejection or attenuation value shall be measured in accordance with the procedures outlined in NEMA LS-1-1992/MIL STD 220A. Noise Filter Capability (100KHz, 1MHz, 10MHz and 100MHz) shall not be lower than -44db attenuation.
- F. TVSS shall provide protection in the following modes.
 - 1. Line to Neutral (L-N) (Wye)
 - 2. Line to Ground (L-G) (Wye or Delta)
 - 3. Neutral to Ground (N-G) (Wye)
- G. Rate surge protective device for continuous operation under the following service conditions:
 - 1. Altitude: 0-12,000 ft.
 - 2. Humidity: 95% RH, non-condensing atmosphere.
 - 3. Surface Temperature: less than 55°C.
 - 4. Operating Temperature -40° C to +60°C.
 - 5. Frequency 50-60 Hertz.
 - 6. No Audible Noise

2.02 ELECTRICAL EQUIPMENT TVSS APPLICATIONS:

- A. TVSS equipment shall be a multi-stage parallel protector rated for voltage, phase, and the wire, plus ground and be mounted by electrical equipment manufacturers.
- B. The equipment's minimum surge current capacity shall be:
 - 1. 200kA per mode (L-N, L-G, and N-G).

2.03 BRANCH CIRCUIT PANEL PROTECTION

- A. TVSS equipment shall be a multi-stage parallel protector rated for voltage, phase, and the wire, plus ground and be bus-to-bus mounted by electrical equipment manufacturer or externally field mounted as indicated on the drawings provided by electrical equipment manufacturer of the branch panel board.

B. The equipment's minimum surge current capacity shall be:

1. 65kA per mode (L-N, L-G, and N-G).

2.04 MANUFACTURERS

A. Service Entrance System equipment, Switchboards, Switchgear, MCCs: Acceptable Manufacturers and Models:

1. General Electric Tranquell THE/TV20
2. Current Technology: TG200
3. LEA International equal product.
4. MTL Surge Technologies Zone Master equal product.
5. Electrical equipment manufacture's products that meet the specified criteria herein.
6. No other Manufacturers will be accepted.

B. Panelboards: Acceptable Manufacturers and Models:

1. General Electric Tranquell TME/TV65
2. LEA International equal product.
3. MTL Surge Technologies Zone Master equal product.
4. Electrical equipment manufacture's products that meet the specified criteria herein.
5. No other Manufacturers will be accepted.

2.05 PRODUCT DATA

The following information shall be provided in accordance with Section 01300:

1. Operation and maintenance information as specified in Section 01300.
2. Warranty specified in paragraph 16445-1.02 E.

PART 3--EXECUTION

3.01 GENERAL

Verify TVSS specified and ratings indicated are furnished. Manufacturer's representative shall visit the site, verify installation and testing, and verify that the TVSS equipment and TVSS installation meets intent of the Contract Documents and manufacturer's warranties and that the guarantees are in effect.

3.02 INSTALLATION

- A. Install according to manufacturers recommendations.
- B. Lead lengths shall not exceed 18"
- C. Electrical equipment manufacturer shall provide integral TVSS.

- D. Electrical equipment manufacturer shall authorize and perform all bus taps electrical connections, as necessary.

3.03 TRAINING

Provide a minimum of 1-hours of training for all similar TVSS systems and conforming to the requirements of Section 01664. Training shall be certified on Form 11000-B specified in Section 01999.

END OF SECTION

SECTION 16450

GROUNDING SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. Furnish and install a complete grounding system in strict accordance with Article 250 of the National Electrical Code and as hereinafter specified and shown on the Drawings.

B. Related Work Described Elsewhere

1. Wire: Section 16120.
2. Conduit: Section 16110.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. The equipment shall be products of manufacturers who are fully experienced, reputable and qualified in the manufacture of the equipment to be furnished. The system components shall be designed, constructed, delivered and installed in accordance with the best practices and methods.

1.03 SUBMITTALS

A. Material and Shop Drawings:

1. Copies of all materials required to establish compliance with these specifications shall be submitted in accordance with the provisions of the General Conditions. Submittals shall include at least the following:
 - a. Certified shop drawings with performance data and physical characteristics.
 - b. Descriptive literature, bulletins, and/or catalogs of each item of equipment.
 - c. All information required by Section 01300.
 - d. Complete wiring diagrams and schematics of all power and control systems showing wiring requirements between system and connections to work of other sections.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver a complete system ready to install as job progress requires.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The specifications are intended to give a general description of what is required, but do not cover all details which may vary in accordance with the exact requirements of the equipment as offered. They are, however, intended to cover the furnishings, delivery, installation and field testing of all materials, equipment and apparatus as required. Any additional auxiliary equipment necessary for the proper operation of the proposed installation not mentioned in these specifications, or shown on the Drawings shall be furnished and installed.
- B. The material covered by these specifications is intended to be standard equipment of proven ability and as manufactured by reputable concerns having experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with best practice and methods and shall operate satisfactorily when installed as shown on the Drawings.

2.02 MATERIALS AND EQUIPMENT

- A. Ground rods: Ground rods shall be copper clad steel 3/4 inch x 20 foot, minimum depth. Ground rods shall be copperweld or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The 480 volt switchgear ground bus shall be grounded to a ground loop system. The protecting conduits shall be bonded to the grounding conductor at both ends.
- B. All steel building columns shall be bonded together and connected to the building ground grid.
- C. Motors shall be grounded as hereinafter specified.
- D. Lighting transformer neutrals shall be grounded to the nearest grounding electrode.
- E. Grounding electrodes shall be driven as required. Where rock is encountered, grounding plates may be used in lieu of grounding rods.
- F. All equipment enclosures, motor and transformer frames, conduits systems, cable armor, exposed structural steel and similar items shall be grounded.
- G. Exposed connections shall be made by means of approved grounding clamps. Exposed connections between different metals shall be sealed with No-Oxide Paint

Grade A or equal. All buried connections shall be made by welding process such as Cadweld or equal.

- H. For reasons of mechanical strength, grounding conductors shall be No. 10 AWG minimum copper, minimum size.
- I. All underground conductors shall be laid slack and where exposed to mechanical injury, shall be protected by pipes or other substantial guards. If guards are iron pipe or other magnetic material, conductors shall be electrically connected to both ends of the guard.
- J. The Contractor shall exercise care to insure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.

3.02 INSPECTION AND TESTING

- A. The Contractor shall obtain the services of an NETA recognized testing firm to measure the ground resistance of the system. All test equipment shall be provided by the Contractor and approved by the Engineer. Dry season resistance of the system shall not exceed 5 ohms. If such resistance cannot be obtained with the system as shown, the Contractor shall provide additional grounding as directed by the Engineer, without additional payment.

END OF SECTION

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SECTION 16460

GENERAL PURPOSE TRANSFORMERS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish and install general purpose transformers and all necessary accessories and appurtenances required as here-in-after specified and shown on the drawings.

B. Related Work Described Elsewhere:

1. Raceways and Fittings Section 16110.

C. General Design:

1. General purpose transformers shall be dry type, two-winding type, self cooled, 600V class transformers.
2. Transformers shall be designed for continuous operation at rated KVA, with normal life expectancy as defined in ANSI C57.96.

1.02 QUALITY ASSURANCE

A. Standards

1. National Electrical Manufacturers (NEMA)
2. American National Standards Institute (ANSI)
3. Underwriters Laboratories, Inc. (UL)

B. Equipment Manufacturer

1. Cutler-Hammer
2. Square D. Co.

1.03 SUBMITTALS

A. Materials and Shop Drawings:

1. Copies of all materials to establish compliance with these specifications shall be submitted in accordance with the provisions of the general conditions. Submittals shall include at least the following:

- a. Shop drawings with performance data and physical characteristics.
- b. Complete wiring diagrams and schematics of all power connections.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. General purpose transformers shall be stored indoors and protected against damage at all times.

1.05 WARRANTY AND GUARANTEES:

- A. The equipment manufacturer shall warrant the units being supplied to the Owner against defects in workmanship and materials for a period of one (1) year from the date of equipment startup and acceptance. In the event that the equipment fails to perform as specified, the equipment manufacturer shall promptly repair or replace the defective equipment without any cost to the owner

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Insulation System:
 - 1. Transformers shall be insulated as follows:
 - 150°C insulation with 80°C rise for 2 KVA and below.
 - 185°C insulation with 15°C rise for 3 KVA to 30 KVA
 - 220°C insulation with 150°C rise for 45 KVA to 112.5 KVA
 - 2. All insulation materials shall be flame retardant and shall not support combustion as defined in ASTM D635.
- B. Coil Assemblies:
 - 1. Transformer core shall be constructed with high grade, non-aging, grain-oriented silicon steel with high magnetic permeability and low hysteresis and eddy current losses. The core volume shall allow efficient transformer operation at 10% above the highest tap voltage. Coils shall be wound of electrical grade aluminum with continuous wound construction.
 - 2. Non-ventilated unit coil assembly shall be completely encapsulated in a mixture of resin and aggregate.
 - 3. Four full capacity taps shall be furnished, two 2-1/2 percent above and two 2-1/2 percent below rated primary voltage.

C. ENCLOSURES:

1. The enclosures shall be made of heavy gauge steel and shall be degreased, cleaned, primed, and finished with ANSI 61 color weather-resistant enamel.
2. All ventilation openings shall be protected against falling dirt.
3. The maximum temperature of the enclosure shall not exceed 90°C.
4. The core of the transformer shall be visibly grounded to the enclosure.
5. Enclosure for Lime Building transformer shall be non-ventilating.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. All floor mounted transformers shall be installed on 4-inch concrete housekeeping pads.
- B. All conduit entries to the transformer shall utilize sealtight flexible connectors.

3.02 INSPECTION:

- A. The transformer interior shall be cleaned and free of all foreign materials.

END OF SECTION

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SECTION 16490 SWITCHBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Distribution switchboards rated 600 V and less.
 - 2. Disconnecting and overcurrent protective devices.
 - 3. Instrumentation.
 - 4. Accessory components and features.

1.03 SUBMITTALS

- A. Product Data: For each type of switchboard, overcurrent protective device, transient voltage suppression device, ground-fault protector, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
- B. Shop Drawings: For each switchboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
 - 5. Include descriptive documentation of optional barriers specified for electrical insulation and isolation.
 - 6. Include evidence of NRTL listing for series rating of installed devices.
 - 7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 8. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.
 - 9. Include schematic and wiring diagrams for power, signal, and control wiring.
- C. Qualification Data: For qualified Installer.

- D. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
 - 1. Routine maintenance requirements for switchboards and all installed components.
 - 2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 - 3. Time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.
- B. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Comply with NEMA PB 2.
- F. Comply with NFPA 70.
- G. Comply with UL 891.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.
- B. Handle and prepare switchboards for installation according to NEMA PB 2.1.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry and work above switchboards is complete.

1.07 COORDINATION

- A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

1.09 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Potential Transformer Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
 - 2. Control-Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
 - 3. Fuses and Fusible Devices for Fused Circuit Breakers: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 - 4. Fuses for Fused Power-Circuit Devices: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 - 5. Indicating Lights: Equal to 10 percent of quantity installed for each size and type, but no fewer than one of each size and type.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Square D; a brand of Schneider Electric or comparable product by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. Square D; a brand of Schneider Electric.
- C. Front-Connected, Front-Accessible Switchboards:
 - 1. Main Devices: Fixed, individually mounted.
 - 2. Branch Devices: Panel mounted.
 - 3. Sections front and rear aligned.
- D. Nominal System Voltage: 480Y/277 V.
- E. Main-Bus Continuous: As indicated on the drawings.
- F. Indoor Enclosures: Steel, NEMA 250, Type 1.

- G. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.
- H. Barriers: Between adjacent switchboard sections.
- I. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.
- J. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- K. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
- L. Pull Box on Top of Switchboard:
 - 1. Adequate ventilation to maintain temperature in pull box within same limits as switchboard.
 - 2. Set back from front to clear circuit-breaker removal mechanism.
 - 3. Removable covers shall form top, front, and sides. Top covers at rear shall be easily removable for drilling and cutting.
 - 4. Bottom shall be insulating, fire-resistive material with separate holes for cable drops into switchboard.
 - 5. Cable supports shall be arranged to facilitate cabling and adequate to support cables indicated, including those for future installation.
- M. Buses and Connections: Three phase, four wire unless otherwise indicated.
 - 1. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity, with tin-plated aluminum or copper feeder circuit-breaker line connections.
 - 2. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with mechanical connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
 - 3. Ground Bus: Minimum-size required by UL 891, hard-drawn copper of 98 percent conductivity, equipped with mechanical connectors for feeder and branch-circuit ground conductors.
 - 4. Main Phase Buses and Equipment Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
 - 5. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.

2.02 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits.

Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
 - a. Instantaneous trip.
 - b. Long- and short-time pickup levels.
 - c. Long- and short-time time adjustments.
 - d. Ground-fault pickup level, time delay, and I^2t response.
4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
6. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
 - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - d. Shunt Trip: 120-V trip coil energized from separate circuit.

2.03 INSTRUMENTATION

- A. Instrument Transformers: IEEE C57.13, NEMA EI 21.1, and the following:
 1. Potential Transformers: IEEE C57.13; 120 V, 60 Hz, double secondary; disconnecting type with integral fuse mountings. Burden and accuracy shall be consistent with connected metering and relay devices.
 2. Current Transformers: IEEE C57.13; 5 A, 60 Hz, secondary; bar or window type; double secondary winding and secondary shorting device. Burden and accuracy shall be consistent with connected metering and relay devices.
 3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kVA.
 4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker, ground-fault protection.
- B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:
 1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:

- a. Phase Currents, Each Phase: Plus or minus 1 percent.
 - b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
 - c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
 - d. Megawatts: Plus or minus 2 percent.
 - e. Megavars: Plus or minus 2 percent.
 - f. Power Factor: Plus or minus 2 percent.
 - g. Frequency: Plus or minus 0.5 percent.
 - h. Accumulated Energy, Megawatt Hours: Plus or minus 2 percent; accumulated values unaffected by power outages up to 72 hours.
 - i. Megawatt Demand: Plus or minus 2 percent; demand interval programmable from five to 60 minutes.
 - j. Contact devices to operate remote impulse-totalizing demand meter.
 - k. Current and Voltage Total Harmonic Distortion per phase.
2. Mounting: Display and control unit flush or semi-flush mounted in instrument compartment door.

2.04 CONTROL POWER

- A. Control Circuits: 120-V ac, supplied through secondary disconnecting devices from control-power transformer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Receive, inspect, handle, and store switchboards according to NEMA PB 2.1.
- B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.
- C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install switchboards and accessories according to NEMA PB 2.1.
- B. Equipment Mounting: Install switchboards on concrete base, 4-inch nominal thickness. Comply with requirements for concrete base specified in Division 03 Section "Cast-in-Place Concrete."
 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

4. Install anchor bolts to elevations required for proper attachment to switchboards.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.
- D. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- E. Install filler plates in unused spaces of panel-mounted sections.
- F. Install overcurrent protective devices, transient voltage suppression devices, and instrumentation.
 1. Adjust circuit breaker trip and time delay settings to values as instructed by switchboard manufacturer.
- G. Comply with NECA 1.

3.03 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.04 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Acceptance Testing Preparation:
 1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
 2. Test continuity of each circuit.
- C. Tests and Inspections:
 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.
 - c. Instruments and Equipment:
 - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Switchboard will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.05 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges as indicated.

3.06 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories, and to use and reprogram microprocessor-based trip, monitoring, and communication units.

END OF SECTION

SECTION 16500
LIGHTING SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish and install complete lighting systems including panelboards, transformers, lighting fixtures, receptacles, switches, contractors, and all necessary accessories and appurtenances required as hereinafter specified and shown on the Drawings.

B. Related Work Described Elsewhere

1. Panelboards: Section 16160.
2. Transformers: Section 16108.
3. Conduit: Section 16110.
4. Wire: Section 16120.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. The equipment shall be a product of manufacturers who are fully experienced, reputable and qualified in the manufacture of the equipment to be furnished. The system components shall be designed, constructed, delivered and installed in accordance with the best practices and methods.
2. The system shall be furnished by a single manufacturer who shall be responsible for the coordination of the system design and who shall assume complete responsibility for the proper operation of the system including equipment supplied but not of his manufacture.

B. Standards:

All lighting fixtures shall be in accordance with the National Electrical Code and shall be constructed in accordance with the latest edition of the Underwriters Laboratories "Standards for Safety, Electrical Lighting Fixtures". All lighting fixtures shall be Underwriters Laboratories labeled.

1.03 SUBMITTALS

A. Material and Shop Drawings:

1. Copies of all materials to establish compliance with these specifications shall be submitted in accordance with the provisions of the General Conditions. Submittals shall include at least the following:
 - a. Certified shop drawings with performance data and physical characteristics.
 - b. Descriptive literature, bulletins, and/or catalogs of each item of equipment.
 - c. A complete total bill of materials for all equipment.
 - d. Complete wiring diagrams and schematics of all power and control systems showing wiring requirements between system and connections to work of other sections.
2. In the event that it is impossible to conform with certain details of the specifications, describe completely all non-conforming aspects of the Shop Drawing transmittal.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The specifications are intended to give a general description of what is required, but do not cover all details which may vary in accordance with the exact requirements of the equipment as offered. They are, however, intended to cover the furnishing, delivery, installation and field-testing of all materials, equipment and apparatus as required. Any additional auxiliary equipment necessary for the proper operation of the proposed installation not mentioned in these specifications, or shown on the Drawings shall be furnished and installed.
- B. The material covered by these specifications is intended to be standard equipment of proven ability and as manufactured by reputable concerns having experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with best practice and methods and shall operate satisfactorily when installed as shown on the Drawings.

2.02 MATERIALS AND EQUIPMENT

A. Lighting Fixtures:

1. Lighting fixture types shall be as shown on the "Lighting Fixture Schedule" on the Drawings. The catalog numbers listed are given as a guide to the design and quality of fixture desired. Equivalent designs and equal quality fixtures of other manufacturers will be acceptable.

B. Lamps:

1. LED lamps shall be 4000K, with drivers, all as indicated on the "Fixture Schedule".

C. Flexible Fixture Hangers:

1. Flexible fixture hangers used in nonhazardous areas shall be Type ARB and flexible fixture supports used in hazardous areas shall be Type ECHF as manufactured by the Crouse-Hinds Company or equal.
2. FRP channel shall be used to span for mounting of fixtures when required by fixture location or as indicated on the Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Each fixture shall be a complete finished unit with all components, mounting and/or hanging devices necessary, for the proper installation of the particular fixture in its designation location and shall be completely wired ready for connection to the branch circuit wires at the outlet.
- B. When fixtures are noted to be installed flush, they shall be complete with the proper accessories for installing in the particular ceiling involved. All flush mounted fixtures shall be supported from the structure and shall not be dependent on the hung ceilings for their support.
- C. Flexible fixture hangers shall be used for all pendant mounted fixtures.
- D. Conduit run in areas with hung ceilings shall be installed in the space above the hung ceiling as close to the structure as possible. Conduit shall be supported from the structure.

3.02 REPLACEMENT

- A. Lamps used during the building construction, prior to two weeks from completion of the work, shall be removed and replaced with new lamps.

3.03 CLEANING UP

- A. All fixtures shall be left in a clean condition, free of dirt and defects, before acceptance by the Engineer.

END OF SECTION

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SECTION 16601

LIGHTNING PROTECTION SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work:
 - 1. Furnish all labor, materials, equipment and incidentals required and install a complete lightning protection system for the generator structure and electrical building. The system shall include grounding all handrail and platform structures.
 - 2. Material requirements shall be as listed for Class I buildings.
- B. Applicable Publications: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. American National Standards Inst., Inc. (ANSI)
C-135.30 Galvanized Ferrous Ground Rods.
 - 2. National Fire Protection Association (NFPA)
70-1987 National Electrical Code (NEC)
78-1986 Lightning Protection Code
 - 3. Underwriters Laboratories, Inc. (UL)
UL-96 Lightning Protection Components
UL-96A Installation Requirements for Lightning
Protection Systems
UL-467 Grounding and Bonding Equipment

1.02 QUALITY ASSURANCE

- A. Equipment Manufacturer: The material furnished under this specification shall consist of the standard products of a manufacturer regularly engaged in the production of lightning protection systems.
- B. Supervision: The system shall be installed under supervision of, or by, a person specifically trained for installation of lightning protection systems.
- C. Lightning protection system shall include a master label per UL.

1.03 SUBMITTALS

- A. Shop Drawings: Shop drawings shall be submitted in accordance with Section 01300 and shall consist of a complete list of materials, including manufacturer's descriptive and technical literature; catalog cuts; drawings; and installation instructions. Shop drawings shall contain details to demonstrate that the system has been coordinated and will function as a unit. Drawings shall show proposed layout and mounting and relationship to other parts of the work.
- B. Proof of Compliance: Where materials or equipment are specified to comply with requirements of the UL, proof of such compliance shall be submitted. The label of or listing in the UL Electrical Construction Materials Directory will be acceptable evidence. In lieu of the label or listing, a written certification may be submitted from an approved nationally recognized testing organization equipped to perform such services, stating that the items have been tested and conform to the requirements and testing methods of Underwriters' Laboratories.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. General Requirements:
 - 1. The system furnished shall be complete with all air terminals, fittings, clamps, supports, roof conductors, down conductors, and horizontal grounds required. The system shall be interconnected with the building ground grid. All conductors, fittings, clamps, and air terminals furnished shall be of the highest quality.
 - 2. System shall be an exposed conductor system. Care shall be taken that the materials used will not discolor roofs or walls. Down conductors shall be protected to 10 feet above grade and shall be located so that visual impact will be minimal.
 - 3. No combination of materials shall be used that form an electrolytic couple of such nature that corrosion is accelerated in the presence of moisture unless moisture is permanently excluded from the junction of such metals. Where unusual conditions exist which would cause corrosion of conductors, conductors with protective coatings or oversize conductors shall be used. Where a mechanical hazard is involved, the conductor size shall be increased to compensate for the hazard or the conductors shall be protected by covering them with molding or tubing made of wood or non-magnetic material.
- B. Aluminum conductors shall not be less than #6 AWG for main conductor and #8 for secondary conductor. Below grade conductors shall be #2/0 bare copper.

- C. Air Terminals: Air terminals shall be OSHA impalement protected, 3/8 inch diameter stainless steel and a minimum 24 inches in length. Air terminals over 24 inches shall be supported.
- D. Ground Rods: Ground rods shall be 3/4 inch by 10 feet copper-clad steel, with the top of the rod, 12 inches below grade minimum and a minimum of 2 feet from building foundation and footings.
- E. Clamp-Type Connectors: Clamp-type connectors shall be of aluminum, bronze, or stainless steel. Clamps shall be secured with at least two (2) bolts or cap screws.
- F. Metal Bodies: Metal bodies of conductance shall be bonded to the system if not within the zone of protection on an air terminal. Metal bodies of inductance shall be bonded to the system at their closest point to the system if within 6 feet of the system at their closest point to the system if within 6 feet of the system main conductor or other bonded metal body. The main lightning conductor shall be bonded to the main potable service water pipe.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General Requirements: The lightning protection system shall consist of air terminals, roof conductors, down conductors, ground connections, and grounds, electrically interconnected to form the shortest distance to ground without passing through any non-conducting parts of the structure. All conductors on the structures shall be exposed except where conductors are in protective sleeves exposed on the outside walls. Exposed down-conductors shall not be allowed on the outside face of any building. Secondary conductors shall interconnect with grounded metallic parts within the building. Interconnections made within side-flash distances shall be at or above the level of the grounded metallic parts.
- B. Air Terminals: Air terminal design and support shall be in accordance with NFPA 78. Terminals shall be rigidly connected to, and made electrically continuous with, roof conductors by means of pressure connectors or crimped joints with of T-shaped malleable metal and connected to the air terminal by a dowel or threaded fitting. Air terminals at the ends of the structure shall be set not more than 2 feet from the ends of the ridge or edges and corners of roofs. Spacing of air terminals 2 feet in height on ridges, parapets and around the perimeter of buildings with flat roofs shall not exceed 25 feet. In specific instances where it is necessary to exceed this spacing, the specified height of air terminals shall be increased not less than 2 inches for each foot of increase over 25 feet. On large, flat or gently sloping roofs, as defined in NFPA 78, air terminals shall be placed at points of the intersection of imaginary lines dividing the surface into rectangles having sides not exceeding 50 feet in length. Air terminals shall be secured against overturning either by attachment to the object to be protected or by means of a substantial tripod or other braces permanently and rigidly attached to the building or structure. Metal projections and metal parts of buildings,

smokestacks, and other metal objects that do not contain hazardous materials and that may be struck but not appreciably damaged by lightning, need not be provided with air terminals. However, these metal objects shall be bonded to the lightning conductor through a metal conductor of the same unit weight per length as the main conductor. Where metal ventilators are installed, air terminals shall be mounted thereon, where practicable. Any air terminal erected by necessity adjacent to a metal ventilator shall be bonded to the ventilator near the top and bottom thereof. Where nonmetallic spires, steeples, or ventilators are present, air terminals shall be mounted thereon or to the side. In addition, where spires or steeples project more than 10 feet above the building, the conductor between the air terminal and metal roof shall be continued to the nearest down conductor and securely connected thereto. Provide impalement protected air terminals as approved by OSHA.

- C. **Roof Conductors:** Roof conductors shall be connected directly to the roof or ridge roll. Sharp bends or turns in conductors shall be avoided. Necessary turns shall have a radius of not less than 8 inches. Conductors shall preserve a downward or horizontal course and shall be rigidly fastened every 4 feet along the roof and down the building to ground. Metal ventilators shall be rigidly connected to the roof conductor at three places. All connections shall be electrically continuous. Roof conductors shall be coursed along the contours of flat roofs, ridges, parapets, and edges; and where necessary, over flat surfaces, in such a way as to join each air terminal to all the rest. Roof conductors surrounding tank tops, decks, flat surfaces, and flat roofs shall be connected to form a closed loop.
- D. **Down Conductors:** Down conductors shall be electrically continuous from air terminals and roof conductors to grounding electrodes. Down conductors shall be coursed over extreme outer portions of the building, such as corners, with consideration given to the location of ground connections and air terminals. Each building or structure shall have not less than two (2) down conductors located as widely separated as practicable, at diagonally opposite corners. On irregularly shaped structures, the total number of down conductors shall be sufficient to make the average distance between them along the perimeter not greater than 100 feet. Additional down conductors shall be installed when necessary to avoid "dead ends" or branch conductors exceeding 16 feet in length, ending at air terminals. Down conductors shall be equally and symmetrically spaced about the perimeter of the structure. Down conductors shall be protected where necessary, to prevent mechanical injury to the conductor.
- E. **Interconnection of Metallic Parts:** Metal doors, windows, and gutters shall be connected directly to the grounds or down conductors using not smaller than No. 6 copper conductor, or equivalent. Conductors placed where there is probability of unusual wear, mechanical injury, or corrosion shall be of greater electrical capacity than would normally be used, or shall be protected. The ground connection to metal doors and windows shall be by means of mechanical ties under pressure, or equivalent.

- F. Ground Connections: Ground connections comprising continuations of down conductors from the structure to the grounding electrode shall securely connect the down conductor and ground in a manner to ensure electrical continuity between the two. All connections shall be of the clamp type. There shall be a ground connection for each down conductor. Metal water pipes and other large underground metallic objects shall be bonded together with all grounding mediums. Ground connections shall be protected from mechanical injury. In making ground connections, advantage shall be taken of all permanently moist places where practicable, although such places shall be avoided if the area is wet with wastewater that contains chemical substances, especially those corrosive to metal.
- G. Grounding Electrodes: A grounding electrode shall be provided for each down conductor located as shown. A driven ground shall extend into the earth for a distance of not less than 10 feet. Ground rods shall be set not less than 2 feet, nor more than 10 feet, from the structure. The complete installation shall have a total resistance to ground of not more than 10 ohms (if a counterpoise is not used). When two of any three ground rods, driven not less than 10 feet into the perimeter, give a combined value exceeding 50 ohms immediately after driving, a counterpoise shall be used. A counterpoise, where required, shall be of No. 2/0 copper cable or equivalent material having suitable resistance to corrosion and shall be laid around the perimeter of the structure in a trench not less than 2 feet deep at a distance not less than 2 feet nor more than 10 feet from the nearest point of the structure. All connections between ground connectors and grounds or counterpoise, and between counterpoise and grounds shall be electrically continuous. Where so indicated on the drawings, an alternate method for grounding electrodes in shallow soil shall be provided by digging trenches radially from the building. The lower ends of the down conductors (or their equivalent in the form of metal strips or wires) are then buried in the trenches.
- H. Interconnection of Metal Bodies: Metal bodies of conductance shall be protected if not within the zone of protection of an air terminal. All metal bodies of conductance having an area of 400 square inches or greater or a volume of 1000 cubic inches or greater shall be bonded to the lightning protection system using main size conductors and a bonding plate having a surface contact area of not less than 3 square inches. Provisions shall be made to guard against the corrosive effect of bonding dissimilar metals. Metal bodies of inductance shall be bonded at their closest point to the lightning protection system using secondary bonding conductors and fittings. A metal body that exceeds 5 feet in any dimension, that is situated wholly within a building, and that does not at any point come within 6 feet of a lightning conductor or metal connected thereto shall be independently grounded.

3.02 TESTING

- A. System shall be installed so that tests of the grounds may be performed upon completion of the installation of the system and in the future.

- B. As soon as practicable after award of contract, the Contractor shall submit for approval complete details of the system including a layout drawing so that the system furnished can be coordinated in the refurbishing of the building.

END OF SECTION

SECTION 16915

REMOTE TELEMETRY

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish all labor, materials, equipment, and incidentals required for a complete telemetry system as hereinafter specified and shown on the Drawings, whether specifically shown or called for.
2. The work, apparatus and materials which shall be furnished under these Specifications and accompanying Drawings shall include all items listed hereinafter an/or shown on the Drawings. All materials necessary for the complete installation shall be furnished and installed by the Contractor to provide complete power, generator, lighting systems, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein whether specifically shown or called for. Certain equipment will be furnished as specified in other Section of this specification which will require conduit and wire to complete the installation as required.
3. The Contractor shall furnish and install the necessary cables, protective devices (surge protection), conductors, exterior electrical system, etc., as indicated on the Drawings and/or as specified hereinafter.
4. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; substandard work will be rejected.

1.02 SUBMITTALS

A. Material and Shop Drawings:

1. Prior to submittal by the Contractor, all shop drawings shall be checked for accuracy and contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.
5. The Engineer's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship

required by the Specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.

6. The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.
7. No material shall be ordered, or shop work started until the Engineer's approval of shop drawings has been given.

B. Manufacturer's Services

1. Provide manufacturer two (2) days services for testing and start-up of the following equipment:
 - a. MCS-RTU

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. The materials used in all systems shall be new, unused, and as hereinafter specified. All materials where not specified shall be of the absolute best of their respective kinds. Samples of materials or manufacturer's specifications shall be submitted for approval as required by the Engineer.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc., listed.
- C. Electrical equipment shall, at all times during construction, be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his own cost and expense. If any apparatus has been subject to injury by water, it shall be thoroughly dried out and put through such special tests as directed by the Engineer, at the cost and expense of the Contractor, or shall be replaced by the Contractor at his own expense.
- D. RTU:
 1. Digital inputs: 8 onboard digital inputs (dry) with selectable wire fault supervision, or direct attach current sensing switch (for easiest pump run indication); expandable to 16 with expansion modules; 3 configurable for pump run summary reporting (number of starts and run time each hour); simultaneous runtimes reported when 2 pumps are monitored.
 2. Analog inputs: two onboard, 4–20 mA isolated or 0–5 VDC; four alarm set points each; expandable to 6 with expansion module.
 3. Relay outputs: three remotely and locally controllable, form C, dry contact relay outputs, 5 A at 30 VDC, 120 VAC, SPDT, N/O or N/C.
 4. AC power: supervised 120 VAC to 12 VAC, 1.2 A, UL-recognized class II/class III transformer.

5. Environment: operating temperature -20—75°C, non-condensing.
 6. Antenna: omnidirectional antenna with 11' cable, SMA termination, universal mounting bracket.
 7. Cellular radio: radios make live, continuous, encrypted TCP socket connections; payload is end-to-end acknowledged; Penta band (850, 900, 1700, 1900, 2100 MHz); AT&T and partners—LTE, HSPA+ 3G; Verizon and partners—LTE, EVDO, 1XRTT, dual SIM carrier capable.
 8. Manufacturer:
 - a. Mission Communications MyDro 850 with expansion modules.
- E. Enclosure shall be free standing, 48x48x8 (min) with legs, NEMA 12 with aluminum backplate and print pocket, 3-point latch door.
- F. Interposing relays shall be provided for all field wiring I/O to the RTU. Allen-Bradly or Sq-D. shall manufacture relays
- G. All field wiring shall include surge protector by Phoenix Contact. Incoming power shall include a circuit breaker and surge protection. All 4-20mA signals shall include signal isolators.
- H. RTU panel shall be UL rated for 5 k SCCR. All wire shall be copper, identified at each end. Terminal blocks by Phoenix Contact.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Prior to installation, Contractor complete and submit the RTU Setup Forms associated with the units to be installed to setupforms@123mc.com. The Contractor shall additionally receive the Account Setup Form and Notification Setup Form, which shall be submitted before installing RTUs.
- B. The following field signals shall be configured for monitoring including spares:
1. CL2 Residual
 2. Turbidity
 3. ATS in Emergency
 4. Generator Running
 5. Master Lift Station High Level
 6. Master LS#1 Run
 7. Master LS#2 pump run
 8. Effluent Pump Station High Level
 9. Plant in Reject Mode
 10. Plant in Normal Mode
 11. Aeration #1 Dissolved Oxygen
 12. Aeration #2 Dissolved Oxygen
 13. Return Sludge Flow #1
 14. Return Sludge Flow #2
 15. Influent Flow
 16. Effluent Flow

17. Bar Screen Trouble
18. Bar Screen Run
19. Blower #1 Run
20. Blower #2 Run
21. Blower #3 Run
22. Blower #4 Run
23. Eq Pump #1 Run
24. Eq Pump #2 Run
25. Eq. High Level
26. Anoxic Mixer #1 Run
27. Anoxic Mixer #2 Run
28. Nutrient Return Pump #1 Run
29. Nutrient Return Pump #2 Run
30. Clarifier #1 Run
31. Clarifier #2 Run
32. Post Anoxic Mixer #1 Run
33. Post Anoxic Mixer #2 Run
34. RAS Pump #1 Run
35. RAS Pump #2 Run
36. Filter Feed Pump #1 Run
37. Filter Feed Pump #2 Run
38. Filter BW Pump #1 Run
39. Filter BW Pump #2 Run
40. Filter Feed Trouble
41. Filter BW Trouble
42. Filters Trouble
43. Chlorine Contact High Level
44. Eight (8) Spare AI
45. Twelve (12) Spare DI

3.02 INSPECTION AND TESTING

- A. Evaluate and test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

END OF SECTION

SECTION 16921

480-VOLT MOTOR CONTROL CENTERS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish, install and test the motor control centers as hereinafter specified and as shown on the Drawings.

1.02 QUALITY ASSURANCE

A. Standards:

1. The motor control centers shall be the product of a manufacturer who shall also be the manufacturer of all the circuit breakers, fused switches and motor starters included in the motor control centers.
2. All units and sections shall be U.L. labeled when possible. Motor control centers containing service entrance equipment shall be U.L. labeled "Suitable For Use As Service Equipment".
3. Motor control centers shall be built and tested in accordance with:
 - a. National Electrical Manufacturers (NEMA).
 - b. American National Standards Institute (ANSI).
 - c. Underwriters Laboratories, Inc. (U.L.).

B. Equipment Manufacturer:

1. The motor control centers shall be Model 6 as manufactured by the Square D. Co., Cutler/Hammer, or General Electric.

1.03 SUBMITTALS

- A. Complete master wiring diagrams and elementary or control schematics, including coordination with other electrical control devices operating in conjunction with the motor control centers and suitable outline drawings shall be furnished for approval before proceeding with manufacture. Due to the complexity of the control functions, it is imperative the above drawings be clear and carefully prepared to facilitate interconnections with other equipment. Standard preprinted sheets or drawings simply marked to indicate applicability to this Contract will not be acceptable.

- B. Submittals shall include a bill-of-material listing conductor material and insulation type as well as other hardware and equipment to be furnished.
- C. Where it is not explicitly shown and completely obvious from the outline drawings, the following items shall be verified in a written statement accompanying the shop drawings:
 - 1. Type of terminal blocks used and that the removal of plug-in compartments can be performed without disconnecting or removing wires.
 - 2. Tin plating of bus.
 - 3. Insulation and isolation of vertical bus.
 - 4. U.L. approval.

PART 2 - PRODUCTS

2.01 RATING

- A. The motor control centers shall be designed for 480 volt, 3 phase, 3 wire, 60 Hz service and shall have short-circuit rating of not less than 42,000 amperes RMS, symmetrical.

2.02 CONSTRUCTION

- A. Structure:
 - 1. The motor control centers shall be a standard metal-enclosed, free-standing, deadfront structure, not more than 90-inches in height, and fabricated from formed sheet steel of not less than No. 14 gauge thickness. The enclosure shall be NEMA 1. The motor control centers shall consist of vertical sections of equal height and 20 inches deep containing individual plug-in compartments. Compartments shall be isolated from each other by separate horizontal steel plates or by steel plates without openings that are a part of the compartment itself.
 - 2. Plug-in compartments shall totally isolate enclosed equipment. All unused openings to the adjacent vertical wiring space shall be plugged. All openings used for wiring shall have insulating grommets.
 - 3. Vertical sections shall be mounted on steel channel sills continuous on four sides, or with steel channel sills on two sides and end cover plates. Each compartment shall be provided with a hinged door of pan construction on the front and a door opening of sufficient size to permit ready removal of any of the equipment in the compartment. Interlocks shall be provided to prevent opening the compartment door when the disconnect device in the compartment is in the closed position. An interlock bypass device shall be furnished. Means of locking the disconnect device in the "Off" position shall be provided. Disconnect device operating mechanism shall not be attached to the compartment door.

4. All sections shall have the same structural features with provisions for the addition of similar sections at either end. Each compartment shall meet NEMA Standards for the control equipment installed and units of similar size shall be interchangeable.
5. Each section shall be provided with a horizontal wiring space which shall line up with a similar space in the adjacent section or sections, with openings between so that wires may be pulled the entire length of the control centers. There shall also be provided in each section a vertical wiring space with separate full height door.
6. The motor control centers shall be designed for against-the-wall mounting. All wiring, bus joints and other mechanical parts requiring tightening or other maintenance shall be accessible from the front or top.
7. The motor control centers shall have engraved laminated nameplates screwed to the doors of each individual compartment and wiring diagrams pasted inside each door. Compartments containing motor starters shall each have an overload heater selection table pasted inside the door.
8. The motor control centers shall provide equipment of type, capacity, trip ratings for the loads shown on the Drawings or otherwise specified.
9. Construction shall be NEMA Class 11, Type B or C. Insofar as possible, all devices and components used shall be of one manufacturer. The motor control centers shall be furnished as a completely factory assembled unit where transportation facilities and installation requirements permit.
10. The motor control centers shall be finished with ANSI Z55.1, No. 61 light gray enamel over a rust resistant primer.
11. The insulation level of the complete motor control assembly shall be such that it will meet the field tests required under Paragraph 3.92.

B. Buses:

1. All buses shall be tin-plated copper. A continuous main horizontal bus shall be furnished. Main buses shall be rated as shown on the Drawings, but shall be not less than 600 amperes.
2. Each vertical section shall have a full height vertical bus rated not less than 300 amperes. Vertical buses shall be insulated and isolated with glass polyester or equivalent continuous insulation. Taped buses will not be acceptable. Unused stab openings shall be plugged. Lower ends of vertical buses shall be insulated.
3. A 1/4 inch x 2 inch ground bus shall be furnished the entire length of the motor control centers.

4. Buses shall be braced for 65,000 amperes RMS, symmetrical, short circuit current.
5. All buses except neutral and ground buses shall be completely isolated by steel plates or insulating material.

C. Wiring

1. All wiring shall be copper.
2. Compartment wiring shall be to compartment mounted, plug-in terminal blocks that allow compartment to be withdrawn without having to remove wires from fixed terminal blocks.
3. Power wiring shall be black. Control wiring shall be red. Wiring energized from sources other than the starter control power transformer shall be yellow. All wiring shall be identified at each termination.

D. Signage:

1. Each motor control center shall be furnished with a sign marked "DANGER - HIGH VOLTAGE". Letters shall be not less than 1-inch high, 114 inch stroke. Signs shall be laminated plastic, engraved red letters with a white background. Signs shall include voltage (i.e. 480v, 120v, etc..) and be fastened to with stainless steel screws and epoxy cement.
2. All compartments with voltages from sources outside of the compartment, not disconnected by the motor circuit protector, shall have a sign on the compartment door marked "CAUTION - THIS UNIT CONTAINS A VOLTAGE FROM A SOURCE OUTSIDE OF THIS UNIT". Letters shall be black on a high visibility yellow background. Background shall be laminated plastic approximately 3 inches x 5 inches.

2.03 COMPONENTS

A. Combination Motor Starters:

1. All motor starters shall be a combination motor circuit protector and contactor, 3-pole, 60 Hz, 600-volt, magnetically operated, of the types shown on the Drawings. NEMA sizes shall be as required for the horsepower shown on the Drawings, but shall be not less than NEMA Size 1.
2. All motor starters shall have a 120-volt operating coil, overload relay in each phase and control power transformer.
3. All motor starters shall have 1-N.O. and 1-N.C. auxiliary contacts. Additional auxiliary contacts shall be furnished where shown on the Drawings or as required by the control scheme.

4. Full voltage, non-reversing starters, NEMA Size 4 and smaller shall be of plug-in type design with stab-on connectors engaging the vertical buses. Larger units shall be of fixed design.
5. Reduced-voltage starters shall be solid state type with isolation contactor and surge protection.

A. Construction

1. The power section shall be three phase, 60 hertz, and rated for the HP, current, and voltage as shown on the drawings. It shall consist of three sets of back-to-back phase-controlled power semi-conductors. Maximum current-limit shall be 500% for standard units.
2. Resistor/Capacitor snubber networks shall be used to prevent false firing of SCR's due to dv/dt characteristics of the electrical system.
3. Fan cooled units shall be supplied with thermal sensors on the heat sink to trip the control protective logic for over temperature condition. Thermal sensors shall be rated 90 degree C maximum.
4. The one piece logic board shall be mounted for easy testing, service and replacement.
5. Three-phase current sensing via current transformers for closed loop control to insure motor stability shall be provided.
6. A contactor shall be placed on the line side of the starter to automatically isolate the solid state starter from the line when starter is not energized.

B. The logic circuitry shall include as a minimum:

1. Short circuit electronic trip overcurrent protection. Time not to exceed 1/2 cycle.
2. Inverse time running overcurrent protection.
3. Auxiliary trip circuitry.
4. Gate firing circuit lockout protection on trip.
5. Fault relay lockout protection.
6. 250% - 500% current limit adjustment
7. Minimum and maximum voltage adjustments.
8. Voltage stability adjustment.
9. Adjustable ramp time (0.5 to 30 seconds)

10. HAND-OFF-REMOTE selector switch

- C. The logic board shall include, as standard, current and voltage sensing circuitry that continually monitor motor load and regulate motor voltage to minimize motor kWh energy consumption.
 - D. External interface circuitry shall include 120 volt relay logic interface capability.
 - E. Tripped functions shall be designed to be cleared by removing power from the solid state logic board.
 - F. The solid state logic shall provide phase sequence protection.
 - G. Two ground lugs shall be furnished, one for incoming and one for outgoing ground connections.
 - H. Power terminations shall consist of pressure type terminals for top or bottom entrance.
 - I. Testing
 - 1. The manufacturer shall supply certified test results, upon request, to confirm that the controller has been tested to substantiate designs according to applicable ANSI and NEMA Standards. The tests shall verify not only the performance of the unit and integrated assembly, but also the suitability of the enclosure venting, rigidity and bus bracing. In addition, the unit shall be factory tested in accordance with ANSI standards.
 - 2. Manufacturer shall be prepared to show proper evidence of having tested for noise immunity on both input and output power connections. Noise testing shall be performed in accordance with NEMA ICA 2-230.40.
- 5. Reduced-voltage starters shall be auto-transformer type with closed circuit transition. Auto-transformers shall be dry type with 50, 65 and 80 percent voltage taps. Auto-transformers shall have over-temperature protection. Timing relays shall be pneumatic, adjustable.
 - 6. Overload relays shall be adjustable and manually reset by push button in compartment door. Replaceable individual overload relay heaters of the proper size shall be installed in each phase.
 - 7. Control power transformers shall be sized for additional load where required. Transformer secondary shall be equipped with time-delay fuses.
 - 8. Motor circuit protectors shall be molded case with adjustable magnetic trip only. They shall be specifically designed for use with magnetic motor starters. Motor

circuit protectors shall have auxiliary disconnect contacts when used with starters having external control circuits.

B. Circuit Breakers:

1. Circuit breakers shall be thermal-magnetic, molded case, 480 volt, with not less than 65,000 amperes, RMS interrupting capacity. All circuit breakers with 225 amperes frames and larger shall have interchangeable trips. Circuit breakers shall have auxiliary disconnect contacts when used with starters having external control circuits.

C. Control Stations:

1. Control stations shall be standard size, heavy-duty, oiltight.

D. Indicating Lights:

1. Indicating lights shall be standard size, heavy duty, low voltage transformer operated as manufactured by Square-D type SK-Class 9001 or equal.

E. Running Time Meters:

1. Running time meters shall be 3-1/2 inch square case; non-reset, 99,999.9 hour range; Type 236 as manufactured by the General Electric Co., or equal.
1. Voltmeters, amp meters, and wattmeter's shall be 4-1/4-inch square, 250-degree scale, plus or minus 1-percent accuracy switchboard instruments; General Electric Co.'s Type AB-40, or equal.
2. A four-position selector switch shall be furnished and installed for selection of three phases and off.

G. Instrument Transformers:

1. Instrument transformers shall be indoor, 600-volt, butyl-rubber molded, metering class designed in accordance with ANSI and NEMA standards.

H. Surge Protection:

1. Surge protection equipment shall be a three-phase surge capacitor and three-phase lightning arrester. The lightning arrester shall be General Electric Company's M.O.V. type, Catalog No. 9L15ECC001, or equal. Surge capacitor shall be General Electric Company Catalog No. 9L18BBB301, or equal.
2. Control Relays:
3. Control relays shall be heavy-duty, machine tool type with suitable rated convertible contacts. Time delay relays shall be pneumatic, adjustable.

4. Relays shall be CR2810 and CR2920 as manufactured by General Electric Co., or equal.
- I. Nameplates:
 1. Unit nameplates shall be black and white laminated plastic having engraved letters approximately 3/16-inch high extending through the black face into the white layer. Nameplates shall identify equipment controlled or circuit designation as applicable.

2.04 SPARE PARTS

- A. The following spare parts shall be furnished:
 1. One (1) box of power fuses of each size furnished.
 2. One (1) set of starter contacts for each NEMA size installed.
 3. One (1) starter coil for each NEMA size installed.
 4. One (1) box of pilot lights.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The motor control center housings shall be bolted to angle iron sills imbedded in the concrete on the two longest sides. The sills shall be the full length of the motor control center housing and shall be installed level in all directions.
- B. Field installed interior wiring shall be neatly grouped by circuit and bound by plastic tie wraps. Circuit groups shall be supported such that circuit termination are not stresses.
- C. The motor control centers shall be maintained in an upright position at all times. Lifting shall be only at the floor sills or the top mounted lifting angle.
- D. The motor control centers shall be protected against damage at all times. Any damage to the paint shall be carefully repaired using touch-up paint furnished by motor control centers manufacturer.

3.02 TESTS AND CHECKS

- A. The following minimum tests and checks shall be made after the assembly of the motor control centers, but prior to the termination of any field wiring.
 1. Megger terminals and buses after disconnecting devices sensitive to megger voltage.
 2. A 1,000 VDC megger shall be used for these tests.

3. The first test shall be made with main circuit breaker closed and all remaining breakers open. A second test shall be made with all circuit breakers closed.
 4. The test results shall be recorded and forwarded to the Engineer for his review. Minimum megger readings shall be 100 megohms in both tests.
 5. Test failures will be the Contractors responsibility to correct at no charge to the Owner.
- B. The following shall be done before energizing the motor control centers:
1. Remove all current transformer shunts after completing the secondary circuit.
 2. Install overload relay heaters based on actual motor nameplate current. If capacitors are installed between starter and motor, use overload relay heaters based on measured motor current.
 3. Check all mechanical interlocks for proper operation.
 4. Vacuum clean all interior equipment.

END OF SECTION

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SECTION 313116

TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Soil treatment.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry" for wood preservative treatment by pressure process.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components, and profiles for termite control products.
 - 2. Include the EPA-Registered Label for termiticide products.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each type of termite control product.
- C. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's records and include the following:

1. Date and time of application.
2. Moisture content of soil before application.
3. Termiticide brand name and manufacturer.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes used, and rates of application.
6. Areas of application.
7. Water source for application.

D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located and who is accredited by manufacturer.

1.7 FIELD CONDITIONS

A. Soil Treatment:

1. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.
2. Related Work: Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.

1.8 WARRANTY

A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work consisting of applied soil termiticide treatment will prevent infestation of subterranean termites, including Formosan termites (*Coptotermes formosanus*). If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain termite control products from single source from single manufacturer.

2.2 SOIL TREATMENT

- A. Termiticide: EPA-Registered termiticide acceptable to authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bayer Environmental Science
 - b. Ensysstex, Inc
 - c. Master Builders Solutions; brand of MBCC Group
 - d. Syngenta Crop Protection, LLC
 - 2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil per termiticide label, interfaces with earthwork, slab and foundation work, landscaping, utility installation, and other conditions affecting performance of termite control.
- B. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Prepare work areas according to the requirements of authorities having jurisdiction and according to manufacturer's written instructions before beginning application and installation of termite control treatment(s). Remove extraneous sources of wood cellulose and other edible materials, such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.
 - 1. Fit filling hose connected to water source at the site with a backflow preventer, according to requirements of authorities having jurisdiction.

3.3 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Distribute treatment uniformly. Apply treatment at the product's EPA-Registered Label volume and rate for maximum specified concentration of termiticide to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction.
 - 1. Slabs-on-Grade Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
 - 2. Foundations: Soil adjacent to and along the entire inside perimeter of foundation walls; along both sides of interior partition walls; around electric conduit penetrating the slab; and along the entire outside perimeter, from grade to bottom of footing.
 - 3. Masonry: Treat voids.
 - 4. Penetrations: At expansion joints, control joints, and areas where slabs and below-grade walls will be penetrated.
- B. Post warning signs in areas of application.
- C. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

3.4 PROTECTION

- A. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- B. Protect termiticide solution dispersed in treated soils and fills from being diluted by exposure to water spillage or weather until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.

3.5 MAINTENANCE SERVICE

- A. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of termite-control-treatment Installer. Include annual maintenance as required for proper performance according to the product's EPA-Registered Label and manufacturer's written instructions. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
- B. Continuing Maintenance Proposal: Provide from termite-control-treatment Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
 - 1. Include annual inspection for termite activity and effectiveness of termite treatment according to manufacturer's written instructions.

END OF SECTION

APPENDIX A
GEOTECHNICAL DATA

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END OF SECTION

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Professional Service Industries, Inc.
1748 33rd Street, Orlando, FL 32839
Phone: (407) 304-5560
Fax: (407) 304-5561

Mr. Robbie Gonzalez, P.E.
Senior Project Manager
CPH, Inc.
1117 East Robinson Street
Orlando, Florida 32801

Re: Report
Geotechnical Engineering Services
Ocoee Wastewater Treatment Plant Improvements
1800 A D Mims Road
Ocoee, Orange County, Florida.

Dear Mr. Gonzalez:

In accordance with your authorization of PSI Proposal No. 0757-357521, **Professional Service Industries, Inc. (PSI), an Intertek company**, has completed a subsurface exploration program at the site of the referenced project. The subsurface exploration was conducted to provide geotechnical engineering recommendations for site preparation and foundation design for the new proposed improvements.

PROJECT INFORMATION

The project site is located within the Ocoee Wastewater Treatment Plant (WWTP) in Ocoee, Orange County, Florida. The site of the proposed improvements is bordered by an existing building and pavement areas to the northeast and existing wastewater treatment systems (above ground storage tanks, treatment tanks, etc.) to the east, south and west. Based on a review of aerial images available through Google Earth Pro, the site is vacant with the ground cover comprising grass and asphalt pavement. Planned improvements for this facility include one new electrical building, a generator pad, transformer pad and swale area. The generator pad will have an approximate plan area of 255± square feet. The electrical building will have a plan area of approximately 792± square feet. The transformer pad will have a plan area of approximately 36± square feet.

PSI was provided with an *Electrical Room Site Plan* (dated June 21, 2022). Based on the information provided, we assume the generator and transformer pads will be designed as structural slab on grade systems. For the new electrical building, we expect it to be relatively light with maximum column and wall foundation loads of less than 50 kips and 3 to 5 kips per linear foot, respectively. We anticipate the building will be supported on conventional shallow footings or a post-tensioned slab.

The listed information/assumptions have been used for the purpose of preparing this report. Adjustments to our recommendations may be necessary if the planned development differs from the noted information/assumptions.



REVIEW OF PUBLISHED DATA

USGS Topographic Map

The topographic survey map published by the USGS entitled "Orlando, Florida" was reviewed for ground surface features in the area of the proposed development. Based on this review, the natural ground surface elevation is on the order of +130 to +140 feet National Geodetic Vertical Datum (NGVD) of 1929.

SCS Soil Survey

The "Soil Survey of Orange County, Florida," published by the USDA SCS, was reviewed for general near-surface soil information within the project vicinity. The SCS indicates two soil mapping units in the project area. The typical characteristics of the mapped soil units provided by the SCS are summarized in the following table.

Soil Series	Depth (inches)	Unified Soil Classification	USDA Seasonal High Groundwater Table
			Depth (feet)
5—Candler fine sand, 5 to 12 percent slopes	0 to 80	SP, SP-SM	>6.0
20—Immokalee fine sand	0 to 80	SP, SP-SM, SM	0 to 1.0

FIELD EXPLORATION

General

To evaluate subsurface conditions for the project, we performed and sampled three (3) Standard Penetration Test (SPT) borings within the area of the planned improvements. The SPT borings were drilled using rotary wash procedures and sampled following Standard Penetration Test (SPT) techniques in general accordance with ASTM D-1586. An automatic hammer was used to obtain the SPT samples. The upper 4 feet of the SPT borings were augered by hand to confirm utility clearance. Below 4 feet, sampling was performed continuously to 10 feet below the existing ground surface with the sampling frequency thereafter being at 5-foot intervals to boring termination. The SPT borings were advanced to a depth of 10 feet below existing grade in the proposed generator pad and stormwater swale area, and to 15 feet below existing grade in the footprint of the new electrical building. The SPT borings were drilled at the approximate locations shown on **Sheet 1** in the **Appendix**. Borings B-1 and B-3 had to be offset to the northwest and southwest respectively, due to the presence of dense underground utilities in the original requested locations.

The soil samples recovered from the borings were returned to our Orlando laboratory for visual stratification. Subsoils were visually stratified following the guidelines contained in the Unified Soil Classification System (USCS). Records of the materials encountered in the borings are presented as soil profiles on **Sheet 2** in the **Appendix**. **Sheet 2** includes a legend describing the subsoils in USCS format, laboratory test results and measured groundwater levels.

The stratification presented is based on visual observation of the recovered soil samples, laboratory testing and interpretation of field logs by a geotechnical engineer. It should be noted that variations in the subsurface conditions are expected and may be encountered between and away from the borings. Also, whereas the individual boring logs indicate distinct strata breaks, the actual transition between the soil layers may be more gradual than shown on the soil profiles.



Soil Conditions

Based on the borings PSI completed for the project, subsurface conditions at the site are relatively consistent in the depth interval explored. The borings encountered a varying sequence of fine sands grading relatively clean to slightly silty and silty in composition (i.e., SP, SP-SM and SM materials). Silty sands were encountered in the bottom 1.5 feet of boring B-1. Based on the SPT blow counts recorded during our field exploration, the sands generally appear to be in a loose to medium-dense condition. Detailed descriptions of the individual borings are shown as soil profiles on **Sheet 2** in the **Appendix**.

Groundwater Conditions

At the time of our field exploration (June 6, 2023), groundwater was encountered in the range 6.7 to 6.8 feet below existing grade. Groundwater levels will fluctuate seasonally in response to rainfall or lack thereof. Additionally, water levels will to some degree be influenced by drainage improvements and irrigation practices in any given area. The estimated normal seasonal high groundwater levels presented herein are based on the observed soil stratigraphy, conditions observed in the borings, USDA Soil Survey information, and our past experience in the project vicinity. In this regard, we estimate the normal seasonal high groundwater table (SHWT) will occur within 3.5 feet of the existing grades.

In general, the normal seasonal high groundwater level is not intended to define a limit or ensure that future seasonal fluctuations in groundwater levels will not exceed the estimated levels. Groundwater conditions will vary with environmental changes and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences, such as swales, drainage ponds, underdrains and areas of covered soil (buildings, paved parking lots, sidewalks, etc.)

SITE SUITABILITY

Based on the results of PSI's borings, it is our opinion that the site is generally suitable for the proposed improvements from a geotechnical engineering perspective. Following completion of site preparation as recommended herein, shallow spread foundations or a post-tension slab can be used for support of the building. Such foundations can be designed for a net allowable bearing pressure of 2,500 pounds per square foot (psf). The generator and transformer pads can be designed as grade supported structural slabs.

More detailed recommendations regarding site preparation and foundation design for the project are provided in the following sections of this report.

SITE PREPARATION CONSIDERATIONS

General

The following recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions encountered. If there is any change in the project criteria, including the location or orientation of the development, a review must be made by PSI to determine if additional fieldwork and/or any modifications to our recommendations will be required. Once final design plans and specifications are available, a general review by PSI is strongly recommended as a means to check that the evaluations made in preparation of this report are correct and that earthwork and foundation recommendations are properly interpreted and implemented.

**Site Clearing/Stripping**

Clearing and grubbing including root raking and removal of any organic-laden topsoil should be completed. This normally includes removing the surface vegetation, stripping topsoil, grubbing major root systems, and removing any miscellaneous debris and/or other deleterious materials. At a minimum, it is recommended that the clearing/stripping operations extend at least ten feet beyond the proposed pavement and structure perimeters, where possible. Material generated during stripping operations should be disposed of off-site in a proper manner as directed by the Owner or used in non-building and pavement areas. Initial site clearing and preparation work should be carried out under the observation of a representative of PSI's Geotechnical Engineer.

Fill Placement and Subgrade Preparation

Following the clearing operations, the exposed subgrade should be evaluated as directed by representatives of PSI to confirm that all unsuitable materials have been removed. Building and structural slab areas should then be proof rolled to provide a stable/unyielding subgrade prior to placing fill. Proof rolling should consist of compaction with a large diameter, vibratory drum roller. The roller should have a drum weight of at least ten tons. Proof rolling should consist of a minimum of ten overlapping coverages of the roller in a crisscross pattern with a maximum travel speed of 2 feet per second.

Compaction can be completed in vibratory or static mode in order to meet the minimum density requirements stated below. Based on experience, the roller should be operated in the static mode when within 75 feet of existing structures to reduce transmission of vibrations that could cause structure damage and disturb building occupants. Careful observations should be made during proof rolling to help identify any areas of soft/yielding soils that may require over-excavation and replacement filling.

For the building and structural slab areas, we recommend that the existing soils, to a minimum depth of one foot below stripped grade, be compacted to at least 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density. Following satisfactory completion of initial compaction of the stripped subgrade, the proposed development areas may be brought up to finished grades as required.

Engineered Fill

Fill for the project should consist of clean fine sand with less than 12 percent by dry weight passing the U.S. Standard No. 200 sieve and be free of rubble, organics, clay, debris and other deleterious material. Fill should be tested and approved prior to import and placement. Each lift should have a loose thickness not exceeding 12 inches. Density tests should be performed to confirm the required compaction is being achieved prior to placing the next lift.

Prior to beginning compaction, soil moisture conditioning may be required. Soil moisture contents should be controlled in order to facilitate proper compaction. A moisture content within two percentage points of the material's optimum indicated by the modified Proctor test (ASTM D-1557) is recommended prior to compaction of the natural ground and fill. All engineered fill should be compacted to at least 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.



DESIGN RECOMMENDATIONS

Foundations

Based on the anticipated construction and recommended site preparation, shallow foundations can be used for building support. Such foundations may be designed for a net allowable bearing pressure of 2,500 pounds per square foot (psf). The foundations and floor slabs should bear on properly placed and compacted cohesionless (sand) fills or on compacted native soils. All footings should be embedded so that the bottom of the foundation is a minimum of 18 inches below adjacent finished grades on all sides. Strip, wall and turndown foundations should be a minimum of 18 inches wide, while column footings should be at least 30 inches square.

The subgrade soils should be compacted to a minimum density requirement of 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density for a minimum depth of two feet below the bottom of footings, as determined by field density compaction tests.

All foundation excavations should be observed by PSI's Geotechnical Engineer or his representative to explore the extent of any fill, excessively loose, soft, or otherwise undesirable materials. If soft or undesirable materials are encountered in the footing excavations, then such materials should be removed and the subgrade re-established by backfilling. This backfilling may be done with a well-compacted, suitable fill such as clean sand (Engineered Fill), gravel, or crushed FDOT No. 57 or FDOT No. 67 stone. Sand backfill should be compacted to at least 95 percent of the material's modified Proctor maximum dry density (ASTM D-1557), as previously described. Gravel/stone should be compacted to a firm/unyielding condition. Immediately prior to placement of reinforcing steel, it is suggested that the bearing surfaces of all footing and floor slab areas be re-compacted using hand operated mechanical tampers. In this manner, any localized areas that have been loosened by excavation operations should be adequately recompacted.

Provided the recommended subgrade preparation operations presented herein are properly performed, total foundation settlement should be on the order of one inch. Differential settlements should be approximately 50 percent of the total movements. These estimates are based on foundation loads being on the order of magnitude discussed herein. The settlement of shallow foundations supported primarily on sandy soils should occur relatively quickly after initial loading. Thus, the majority of expected settlement should occur during construction as dead loads are imposed.

Lateral loads that are applied to the foundations may be resisted by earth pressure mobilized on the buried vertical faces of the footings and by shearing forces acting along the footing-subgrade interface. Earth pressure resistance may be determined using an equivalent fluid density of 360 pounds per cubic foot for moist soil and 180 pounds per cubic foot for submerged soil below the water table. A friction factor of 0.4 should be used to determine base shearing resistance. The noted values are based on the assumption that the footings are surrounded by compacted sand fill.

To develop passive resistances, the foundations must be able to tolerate some lateral movement. We estimate lateral movements in the range of one-quarter to three-eighths of an inch to fully develop the passive resistance. In order to minimize the movement required to develop resistance, the pressure values presented above can be halved. A factor of safety of at least 1.5 is recommended for design.



Floor Slabs

Floor slabs can be safely supported as slab-on-grade systems provided the final subgrade elevation is densified and prepared as recommended herein. We further recommend that the upper one foot of the subgrade soils within the building pad be compacted to at least 95 percent of the maximum dry density of the soil's modified Proctor (ASTM D-1557).

We recommend the floor slab bearing soils be covered by lapped polyethylene sheeting in order to reduce the potential for floor dampness which can affect the performance of floor coverings. This membrane should consist of a minimum six mil thick, single layer of non-corroding, non-deteriorating sheeting material placed to minimize seams and to cover all of the soil below the building floor slabs. Seams should be overlapped a minimum of 12 inches.

For slab design, we recommend a subgrade modulus of 100 pounds per cubic inch (pci) for subgrade prepared as noted herein.

OTHER CONSIDERATIONS

Site Dewatering

If groundwater is encountered, excavations that are only a few feet below the water table can likely be dewatered with a sump pump. Deeper excavations will most likely require well-pointing or sock drains to achieve adequate drawdown. In either case, the dewatering system should be designed and operated to lower the groundwater table to a depth at least 2 feet below the bottom of surfaces to be compacted in any given area. The design and discharge of the dewatering system should be in accordance with current regulatory criteria.

Excavations

In Federal Register, Volume 54, No. 209 (October 1989) the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, general construction excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed the Owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.



LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data.

The scope of our exploration was intended to evaluate soil conditions within the influence of the proposed structure foundations and does not include an evaluation of potential deep soil problems such as sinkholes. The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed development.

The scope of our services provided herein does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

CLOSURE

PSI appreciates the opportunity to provide our services to CPH, Inc. and the City of Ocoee on this project. If you have any questions regarding the contents of this report, or if we may be of further service, please contact the undersigned.

Sincerely,

PROFESSIONAL SERVICE INDUSTRIES, INC.
Certificate of Authorization No. 3684

Paola Castillo, MS.c, M.eng
Staff Engineer

Robert A. Trompke, P.E.
Principal Consultant/Florida Geotechnical Practice Leader
Florida License No. 55456

07572857 Report(Ocoee Wastewater Treatment Plant Improvements).Docx

Appendix:

- Sheet 1 – Boring Location Plan
- Sheet 2 – Boring Profiles



Appendix



**A Full Service
A & E Firm**
1117 East Robinson Street
Orlando, FL 32801
Ph: 407.425.0452

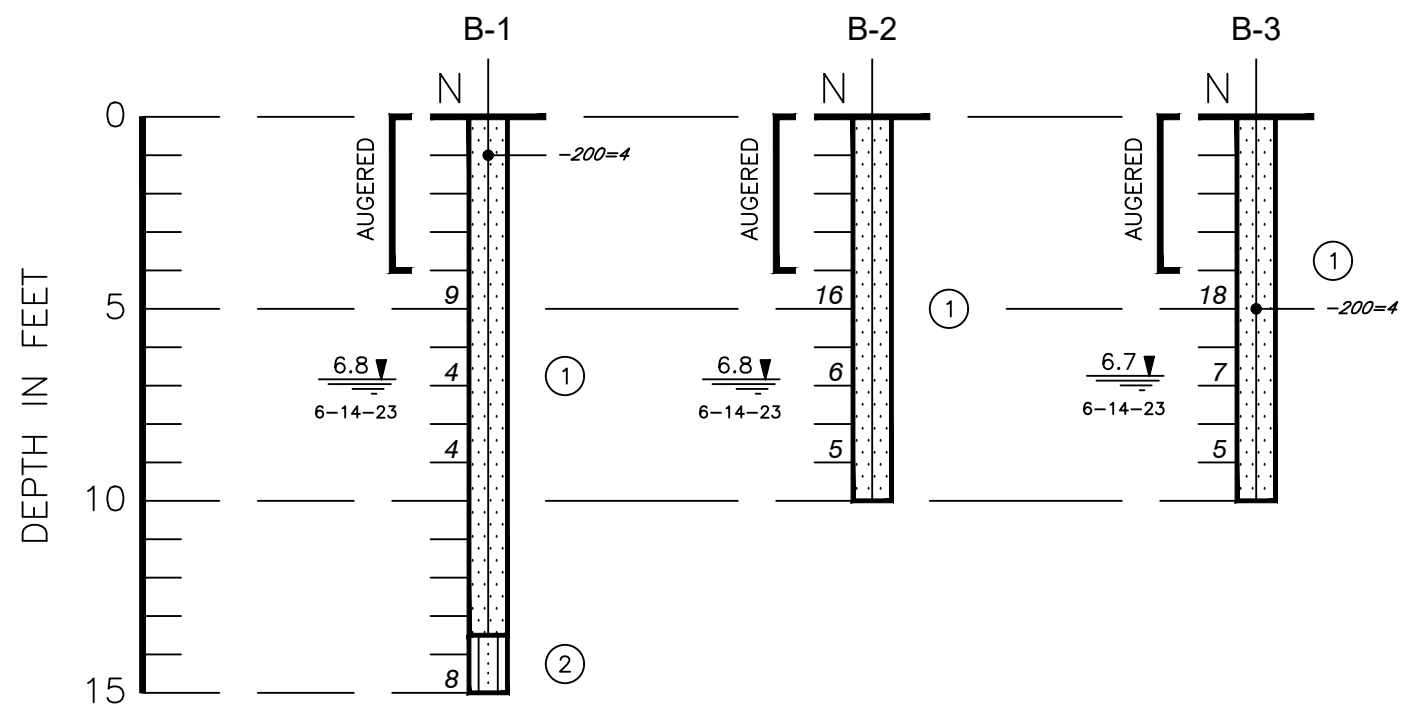
Legend

 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

REFERENCE: THE 2017 AERIAL PHOTOGRAPH WAS OBTAINED FROM ESRI. THE PRESENTED DATA IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. INTERTEK-PSI ASSUMES NO RESPONSIBILITY FOR ANY DECISIONS MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON INFORMATION OBTAINED FROM THE ABOVE DATA.

PROJECT NO: 07572857 SCALE: NOTED DATE CREATED 6-20-23	 1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	GEOTECHNICAL ENGINEERING SERVICES OCOE WASTEWATER TREATMENT PLANT 1800 A D MIMS ROAD OCOE, FLORIDA	SHEET: 1 DRAWN: DJW CHECKED: PC	01530 Feet 1 inch = 30 feet 
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SOIL PROFILES
SCALE: 1"=5'

- LEGEND**
- ① LIGHT GRAY TO GRAY FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
 - ② GRAY SILTY FINE SAND, (SM)
 - (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
 - N STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER
 - 6.8
6-14-23 DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING
 - 200 FINES PASSING #200 SIEVE IN PERCENT

APPENDIX “B”

SECTION 02100
SPECIFIC TECHNICAL SPECIFICATION
(Engineering Standards Manual)

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The City of Ocoee Engineering Standards Manual, a separately covered document, shall be an integral part of the Contract Documents for this project.
- B. Engineering Standards Manual has been included as part of the bid documents in PDF format. Contractor may obtain an additional PDF formatted Engineering Standards Manual from the City of Ocoee Utilities Department.
- C. The Engineering Standards Manual (latest version at the time of bidding the project) is intended to provide construction and material standards, material and systems testing procedures, and construction requirements.
- D. It shall be the Contractor's responsibility to provide/perform all labor, work and material in conformance with the requirements of Engineering Standards Manual.
- E. References to the development community within the Engineering Standards Manual shall not be germane to this project.

END OF SECTION

City of Ocoee Engineering Standards Manual

MISSION

This Engineering Standards Manual is a firm technical guideline for engineering materials' design, construction, and layout for all improvements that shall be dedicated, owned, and/or maintained by the City of Ocoee.

INTRODUCTION

The provisions of this Manual are established in order to effectively carry out the purposes of the **Land Development Code of the City of Ocoee**, in the interests of public health, safety, and welfare of the citizens and inhabitants of Ocoee, Florida.

Should there be any discrepancy or conflict between the Engineering Standards Manual and any applicable City Codes, such as the Land Development Code, the most stringent and restrictive specification, condition and/or directive shall apply. If any item is not specifically addressed in this manual, good engineering standards shall be practiced and is subject to the City Engineer's approval.

DISCLAIMER

The City of Ocoee, in the form of this manual, its attachments and documents referenced herein, is attempting to provide the best available information in an electronic format. It is the responsibility of the recipient to ensure that this information is the most recent, up to date, and in its entirety, as was originally provided by the City. This information is provided as is, without warranty or guarantee of any kind. The entire risk, as to quality, performance, and accuracy, are with the recipient. In no event, is the City of Ocoee or its Staff liable for any direct, indirect, incidental, special, consequential, punitive or other damages whatsoever (including loss of profit, loss of information, interruptions, or other pecuniary losses) arising from the use of or inability to use this data.

I agree to the terms and conditions set forth in this document, take me to the
TABLE OF CONTENTS

I Agree

Engineering Standards Manual

Table of Contents



February 20, 2012

<u>Article</u>			<u>Article</u>
1	General Provisions		Underdrains 18
2	Definitions	Sidewalk/Bike Paths, Concrete Curb, Etc.	19
3	Design Standards	Chain Link Fence	20
4	Right-of-Way Utilization	Grassing and Mulching	21
5	Site Preparation, Surface Removal and Restoration	Pavement Markings	22
6	Excavation, Trenching, and Backfilling	Medians	23
7	Clearing and Grubbing	Turn Lanes and Tapers	24
8	Earthwork	Driveways	25
9	Subbase	Utility Line Installation Requirements	26
10	Soil Cement Base	Wastewater Facilities Design	27
11	Limerock Base	Gravity Sanitary Sewers	28
12	Prime and Tack Coats for Base Course	Sanitary Sewer Force Mains	29
13	Asphaltic Concrete Surface Course	Sanitary Sewer Pump Stations	30
14	Portland Cement Concrete Pavement	Potable Water System	31
15	Quality Control	Reclaimed Water System	32
16	Culverts and Storm Sewers	Horizontal Directional Drilling	33
17	Inlets and Manholes	Stormwater Management	34
Approved Manufacturer's List		Engineering Details	

ARTICLE 1

GENERAL PROVISIONS

Index	1.01	<u>GENERAL</u>
	1.02	<u>REFERENCE MATERIALS</u>
	1.03	<u>PRE-CONSTRUCTION CONFERENCE</u>
	1.04	<u>UTILITY COORDINATION</u>
	1.05	<u>UTILITY CONSTRUCTION</u>
	1.06	<u>START OF CONSTRUCTION</u>
	1.07	<u>CONSTRUCTION COMPLETION</u>
	1.08	<u>OFF-SITE POLLUTION PROTECTION</u>
	1.09	<u>INSPECTION</u>
	1.10	<u>TRANSFER OF PRIVATE OWNERSHIP</u>
	1.11	<u>PROPERTY OWNERSHIPS</u>
	1.12	<u>PLANS AND SPECIFICATIONS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	1.01	<u>GENERAL</u>
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The Standards set forth in this Manual are meant to provide minimum Standards for the design and construction of facilities which meet the following conditions:

- 1) Public and private facilities, to be constructed within the City's corporate limits.
- 2) Facilities to be dedicated to the City for ownership.
- 3) Facilities to become future additions to the City's utilities and transportation systems.

This Manual is not meant to be totally restrictive in nature; that is, it does not depict the only acceptable method of design. Rather, its purpose is to describe minimum acceptable Standards of construction and to promote uniformity. The individual requirements of the Manual shall be superseded by the requirements established for Specially Planned Areas and the Comprehensive Plan, where applicable.

Should any design be submitted which varies appreciably from the Standards set herein or uses materials other than those recommended, it must be accompanied by appropriate supporting documentation or engineering studies for review and is subject to the approval of the City Engineer or his Designee.

All plans submitted for review must be in conformance with all Federal, State and City regulations and codes. In no case shall minimum standards be less than those established by recognized governmental agencies, unless stated otherwise in these Specifications.

Where a certain manufacturer is specified for a particular piece of equipment, non-specified product equals may be approved by the City Engineer or his Designee after submittal of a request in writing and accompanied by supporting documentation. An approved Manufacturer's List is attached as part of this Manual to assist the Engineer and the Contractor.

Pre-application meetings are recommended and pre-Construction conferences are mandatory between the Owner/Developer, their Engineer, their Contractor(s), all utilities, and the City Staff when City facilities are involved.

Section 1.02 REFERENCE MATERIALS

Unless otherwise stated, the most recent publications of the following organizations shall be referred to as required. Other publications may be used in the implementation of the Standards.

- A) Water Environment Federation (WEF)
- B) American Society for Testing Materials (ASTM)
- C) United States Occupational Safety and Health Administration (USOSHA)
- D) American Association of State Highway and Transportation Officials (AASHTO)
- E) American National Standards Institute (ANSI)
- F) American Water Works Association (AWWA)
- G) National Fire Protection Association (NFPA)
- H) National Science Foundation (NSF)
- I) American Society of Civil Engineers (ASCE)
- J) Florida Department of Transportation (FDOT)
- K) Institute of Transportation Engineers (ITE)
- L) Federal Highway Administration (FHWA)
- M) American Asphalt Institute (AAI)
- N) Portland Cement Association (PCA)
- O) American Concrete Institute (ACI)
- P) Underwriters Laboratories, Inc. (UL)
- Q) Insurance Services Office (ISO)
- R) Environmental Protection Agency (EPA)
- S) National Pollutant Discharge Elimination System (NPDES)
- T) Sunshine State One Call System Of Florida (SSOCSOF)
- U) Federal Specification (FS)

Section 1.03 PRE-CONSTRUCTION CONFERENCE

It shall be required that a pre-construction conference between the Owner/Developer, their Engineer, their Contractor, all utilities, and the City Staff be held at least 5 days before commencement of any construction within the corporate limits of the City of Ocoee. All applicable City, State and Federal Agency permits are required to be in the possession of the Owner/Developer prior to the pre-construction meeting.

Section 1.04 UTILITY COORDINATION

It shall be up to the Owner/Developer to coordinate all utilities concerning development. All utilities shall be given notice prior to commencement of construction in accordance with F.S. 553 and F.S.556 and guidelines of SSOCOF.

Section 1.05 UTILITY CONSTRUCTION

Utility lines of any kind, including, but not limited to, traffic signal systems, street lighting, those of franchised utilities, electric power and light, telephone and telegraph, cable television, water, sewer, and gas, shall be constructed and installed beneath the surface of the ground unless it is determined by the City Engineer, and approved by the City Commission, that soil, topographical, or any other compelling conditions make the installation of such utility lines as prescribed herein unreasonable or impractical. It shall be the Owner's/Developer's responsibility to make the necessary arrangement with each utility in accordance with the utility's established policies. The underground installation of incidental appurtenances such as transformer boxes, pedestal mounted boxes for electricity, or similar service hardware necessary for the provision of electric and communication utilities may be required at the discretion of the City Engineer. When appropriate, all materials shall be Listed for the purpose for which it is used.

Section 1.06 START OF CONSTRUCTION

The City Engineer or his Designee shall be notified, in writing, at least 5 days in advance of the proposed date of the beginning of construction. Any time that work is to stop for a period of time in excess of 5 working days, other than stoppage beyond the Contractor's control, and holidays, the City Engineer shall be notified in writing of such interruption. The Engineering Plans, as approved by the City, and all revisions shall be readily accessible to City personnel during all periods of activity. No activity shall be permitted without these documents on-site. Someone of responsible charge must be on-site during all construction activities.

Section 1.07 CONSTRUCTION COMPLETION

All requirements stated in the LDC shall be complied with by the Owner/Developer prior to any occupancy of any private or public improvements.

Section 1.08 OFF-SITE POLLUTION PROTECTION

It shall be the Owner's/Developer's responsibility to provide, in accordance with the LDC, all associated Ordinances and State and Federal Agencies, and the NPDES regulations, all downstream and offsite water quality and siltation protection required during construction. In any event, it shall be the Owner's/Developer's responsibility to remove any downstream siltation prior to the time of final inspection. Air pollution, such as dust, shall also be controlled at all times.

Section 1.09 INSPECTION

1.09.01 Periodic

Representatives of the City shall periodically visit the project site to make a visual inspection of the progress of the work and methods of construction. Upon observation of work not done in accordance with the Plans and Specifications, the City will notify the Owner's/Developer's Contractor and the Owner/Developer or his Designee and request that the necessary corrections be made. All inspections shall be scheduled a minimum of 24 hours in advance. Special inspections requested by Owner/Developer. The City can come out at any time without prior notice.

1.09.02 Substantial Completion

Substantial Completion inspection may be provided when the project justifies the need for the process prior to the issuance of a Certificate of Completion. The Owner/Developer must submit a written request for a formal Substantial Completion inspection and shall include the following;

- a) Exclude wall, landscaping, irrigation, and other amenities.
- b) Include water, sewer, reuse, storm roads, rough grading and signage (FDEP Water and Sanitary clearances shall have been issued).
- c) Require a written document from developer requesting formal inspection.
- d) Reference that developer has already punch listed project and all items completed.
- e) State that project is built in accordance with plans and specifications and include an initial set of As-Built Drawings.
- f) Engineering Department will schedule an all department formal inspection with written punch list back to Engineering Department.

- g) Engineering Department will coordinate with OCPW, OCUD and FDOT as applicable.

Engineering will review all punch lists and make determination of Substantial Completion. A written response to developer on substantial completion including all punch lists will be provided to the Owner Developer. If deemed to be Substantially Complete the developer can start construction of production homes.

1.09.03 Final

The City shall be notified when the project is complete. Upon receiving at least a 48 hour prior request, excluding weekends and holidays, for final inspection of the completed work, the City's representatives, together with the representatives of other interested agencies, shall perform the final inspection. The following submittals shall be required prior to Final Inspection: Payment for any failed material tests, all applicable Certifications of Completion from other agencies, Clearances for Utility Systems and Final Record Drawings, including digital and hard copies.

Section 1.10 TRANSFER OF PRIVATE OWNERSHIP

When transfer of private facilities to public ownership is desired and the City Engineer concurs, all such private facilities shall be brought up to the current City Standards at no cost to the City, in so far as construction and maintenance are concerned, before the City will accept such facilities. Proof of satisfactory completion of the facilities, approved construction plans as Record Drawings, the 2 year maintenance bond with itemized construction costs, Bill of Sale for improvements dedicated to the City, and the appropriate legal documents shall be furnished to the City Engineer prior to acceptance.

Section 1.11 PROPERTY OWNERSHIPS

All facilities to be owned and maintained by the City shall be located on City property, within City rights-of-way, or in easements dedicated to the City for the uses intended.

Section 1.12 PLANS AND SPECIFICATIONS

1.12.01 General

All submitted plans shall be standard size sheet (24" x 36" or 11" x 17") with title block. Graphic scale(s) shall be provided on each sheet and all lettering shall be 0.08 x scale (Leroy 80) or larger to permit photographic reproduction. Color aerial photography plan sheet(s) is/are required for the property/project area and shall include an area 100' outside the limits of the proposed project improvements. Submittal of Specifications shall only be required when special facilities outside the scope of this Manual are proposed. All Plan sheets, detail sheets and the title page of submitted and Bound Specifications must be signed, sealed and dated by the Engineer of Record licensed in the State of Florida.

1. 12.02 Master Plan

Whenever possible, the entire water, reuse, and wastewater systems shall be shown on a single Master Plan. The Master Plan shall indicate the general locations of all mains, manholes, valves, hydrants, services and service laterals with respect to the proposed development improvements and the existing water and wastewater systems. Main sizes shall be indicated on the Master Plan.

1. 12.03 Plan and Profile

All utilities including gravity sewers, all wastewater force mains, storm sewers and off-site water mains shall be drawn in plan and profile. On-site water and reuse mains may be shown in plan view only.

Whenever possible, on-site water and wastewater systems shall be shown on the same Plans sheet. As a minimum, the plan and profile drawings shall include the following information:

- A) General information such as north arrow, names of Designer and Engineer, revision block with dates, graphic scale(s) and sheet number.
- B) Plan and profile with elevations at 100 foot intervals, or more frequently if required by good design practice.
- C) Development layout with horizontal and vertical controls.
- D) All conflicts with other utility and drainage systems.
- E) All manhole locations and rim elevations for manholes outside of paved areas.
- F) Pipe data including size, lengths, material, and slopes.
- G) Size, type, and locations of fittings, valves, hydrants, air release/vacuum relief, and other related appurtenances.
- H) Limits of pipe deflection. (Would not recommend allowing – require fittings)
- I) Limits of special exterior coatings.
- J) Limits of special bedding requirements.
- K) Pipe restraint requirements and limits of restrained joints.
- L) Details of connection to existing systems.
- M) Location(s) and general layout of wastewater pumping stations.

- N) Construction notes regarding cover, horizontal and vertical control, special construction requirements, and references to standard and special details.
- O) Point of Service for fire sprinkler system and location of fire department connection.

1. 12.04 Details

The Plans shall include all applicable Standards as identified in this Manual with appropriate Details. Special details shall be prepared by the Engineer for aerial and underwater crossings of rivers, streams, canals and ditches. Other special details shall be prepared by the Engineer as required.

1. 12.05 Scale

The Master Plan shall be prepared at a scale not to exceed 1" to 200'. Plan and profile sheets shall not exceed a scale of 1" to 50' horizontally and 1' to 5' vertically. Special details shall be of sufficiently large scale to show pertinent construction information.

1. 12.06 Complete Submittals

Plans for any review and submittal shall be complete. The Owner shall be responsible for payment of fees when the City provides reviews more extensive than reasonably expected due to the submittal being incomplete and/or inadequate.

ARTICLE 2

DEFINITIONS

[**BACK TO TABLE OF CONTENTS**](#)

Except where specific definitions are used within a specific ARTICLE or Section of this resolution or the purpose of such Sections, the following terms, phrases, words, and their derivation shall have the meaning given herein when not inconsistent with the context. Words used in the present tense include the future tense, words in the plural number include the singular number and words in the singular number include the plural number. The word “shall” is mandatory, and the word “may” is permissive.

AASHTO - means American Association of State Highway and Transportation Officials. Any reference to AASHTO Standards shall be taken to mean the most recently published revision unless otherwise specified.

ANSI - means American National Standards Institute. Any reference to ANSI Standards shall be taken to mean the most recently published revision unless otherwise specified.

ASTM - means American Society for Testing Materials. Any reference to ASTM Standards shall be taken to mean the most recently published revision unless otherwise specified.

AWWA - means American Water Works Association. Any reference to AWWA Standards shall be taken to mean the most recently published revision unless otherwise specified.

City - means the City of Ocoee, Florida.

City Engineer - means the Engineer or his designee or other appointed officer of Ocoee, Florida, acting directly or through an assistant or other appointed representative, acting only within the scope of the particular duties assigned by the Land Development Code.

Construction Inspector - means the construction representative of the Engineering Department or other field appointed representative, acting only within the scope of the particular duties assigned by the City Engineer.

Contractor - means the person, firm, or corporation with whom the contract for work has been made by the Owner/Developer or the City.

Developer - means any person or legal entity who is responsible for any undertaking that requires an administrative or regulatory permit.

DIPRA - means Ductile Iron Pipe Research Association.

Drawings - means engineering drawings prepared by an ENGINEER to show proposed construction.

ENGINEER - means a Professional Engineer or engineering firm registered with the Florida State Board of Professional Engineers, other than direct employees of the City of Ocoee, retained to provide professional engineering services for a project.

FDOT - means the Florida Department of Transportation.

Geotechnical/Soils Engineer - means a Registered Florida Engineer who provides services related to terrain evaluation and site selection, subsurface exploration and sampling, determination of soil and rock properties, foundation engineering, settlement and seepage analysis, design of earth and earth retaining structures; as well as the design of subsurface drainage systems and the improvement of soil properties and foundation conditions; as well as testing and evaluation of construction materials.

ISO - means Insurance Services Office. Any reference to ISO Standards shall be taken to mean the most recently published revision unless otherwise specified.

Landscape Architect - means a Landscape Architect registered in the State of Florida who provides professional services related to the planning and development of land and incidental water areas, where the purpose of these consulting services is the preservation, conservation, enhancement, or determination of land uses, natural and man-made features, siting of buildings and structures, grounds and approaches, the setting of grades, contouring of land and water forms, determination of stormwater drainage, and irrigation systems. (From Florida Statute Chapter 481, Part II.)

LDC - means the Land Development Code of the City of Ocoee, Florida.

Listed - means equipment, materials, or services included in a list published by an organization acceptable to the authority having jurisdiction and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states either that the equipment, material, or service meets identified standards or has been tested and found suitable for a specified purpose.

Manual - means this City of Ocoee Engineering Standards Manual.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) - means the United States Department of Transportation Manual on Traffic Control Devices, latest edition, unless otherwise specified.

NEMA - means National Electrical Manufacturers Association. Any reference to NEMA Standards shall be taken to mean the most recently published revision unless otherwise specified.

NSF - means National Sanitation Test Laboratory Foundation. Any reference to NSF Standards shall be taken to mean the most recently published revision unless otherwise specified.

OSHA - means the Federal Occupational Safety and Health Administration. Any reference to OSHA Standards shall be taken to mean the most recently published revision unless otherwise specified.

Owner - means any person or legal entity having sufficient proprietary interest to undertake development pursuant to the Land Development Code.

Plans - means Drawings as defined herein above.

Public Works Director - means the Engineer or other appointed officer of Ocoee, Florida, acting directly or through an assistant or other appointed representative, acting only within the scope of the particular duties assigned by the Land Development Code.

Specifications - means the specifications contained in this Manual.

Standards - means the minimum design Standards contained in this Manual.

Standard Specifications - means the Department of Transportation, State of Florida, Standard Specification for Road and Bridge Construction, latest edition, unless otherwise specified.

Substantially Completed - means that date when the work is completed in accordance with this Manual or the Projects Contract Documents, with the exception of the minor items identified during the inspection process. Upon substantial completion, the work can be utilized for the purposes for which it is intended if the public's health, safety, and welfare will not be endangered.

Typical City Details - means the detailed drawings in this Manual related to general civil engineering materials and installation.

ARTICLE 3

DESIGN STANDARDS

Index	3.01	<u>GENERAL</u>
	3.02	<u>STREETS AND OTHER PAVEMENTS</u>
	3.03	<u>EASEMENTS</u>
	3.04	<u>SURVEY MONUMENTS</u>
	3.05	<u>CURBS AND GUTTERS</u>
	3.06	<u>STORMWATER MANAGEMENT</u>
	3.07	<u>DECORATIVE ENTRANCES</u>
	3.08	<u>OWNER/DEVELOPER CONTROL DURING CONSTRUCTION</u>
	3.09	<u>EROSION CONTROL</u>
	3.10	<u>PHASED DEVELOPMENT</u>
	3.11	<u>TRAFFIC CONTROL DURING CONSTRUCTION</u>
	3.12	<u>RESIDENTIAL DEVELOPMENT</u>
	3.13	<u>TRAFFIC SIGNAL PRE-EMPTION SYSTEM</u>

[BACK TO TABLE OF CONTENTS](#)

Section	3.01	<u>GENERAL</u>
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The lands included within the development shall be suitable for the various purposes proposed and shall not be subject to poor drainage, erosion or other conditions detrimental to the health, safety and general welfare of the public. Further, no development plan shall be approved unless the City finds, after full consideration of all pertinent data, that the development can be served adequately with such normal public facilities and services as are suitable in the circumstances of the particular case. The Owner/Developer shall be responsible for the acquisition of all materials, installation and construction costs, and legal documentation for all on-site and off-site activities of the proposed development.

A Professional Engineer, registered in the State of Florida and qualified by virtue of training and experience to practice the engineering discipline involved, shall be employed to design all required improvements such as streets, traffic control, drainage structures, bridges, bulkheads, and utility facilities, and to provide such professional services during construction as are generally considered to be part of a complete engineering service. Upon request, the Owner/Developer shall submit to the City Engineer signed documentation to this effect. All plans for improvements shall be prepared and sealed by such Engineer and approved by all appropriate regulatory agencies and the City prior to the commencement of the improvements. Street lighting plans for the development shall be prepared by the power company supplying service to the development. Florida Statute shall govern the preparation of all site plans and related engineering drawings submitted to the City.

3.01.01 Conformance with City Policy

The subdividing and/or development of any areas shall conform to the adopted general goals and objectives of the City with respect to the physical development of the City as set forth in various documents including, but not limited to:

- A) The Ocoee Comprehensive Plan.
- B) City policies and Services and Facilities as enunciated by applicable City Ordinances.
- C) The Land Development Code of the City of Ocoee.
- D) The Engineering Standards Manual.
- E) Ordinances of the City of Ocoee.

3.01.02 Use of Natural Features

The arrangement of structures, stormwater systems, lots and blocks, and the street system shall make the most advantageous use of topography and preserve mature trees, wetlands, and other natural features wherever possible.

3.01.03 Consideration of Soil and Flood Hazards

All land intended for use in a development plan for building sites must be able to be used safely for building purposes without danger from flood or other inundation, or from adverse soil or foundation conditions or from any other menace to health, safety, or public welfare. No filling or grade level change shall be permitted which will reduce the flood storage volume available between the base flood elevation and the normal ground water elevation to adversely affect any surrounding area. No development shall be permitted in the 100 year flood plain. The Orange County Soil Survey is to be used as a guideline in identifying soil properties and interpretations for various uses in terms of soil limitations and soil features adversely affecting a particular use.

The following Standards shall be followed in areas of low and very low potential soils:

- A) Soils with either very low potential or low potential for proposed uses, as identified in the Soil Survey, shall not be developed unless such soils are removed or modified to accommodate the intended use, as approved by the City Engineer.
- B) Public facilities shall not be constructed where the soil performance for said public facility is of low or very low potential, except in cases of overriding public interest.
- C) Dedication shall not be accepted for public ownership or maintenance of utilities or roads constructed in areas where soil performance for said facilities is of low or very low potential.

3.01.04 Special Considerations

Special consideration shall be given in the layout of streets, lots, blocks, buildings, and easements to the preservation of large and specimen individual trees as identified by the Ocoee Comprehensive Plan. Special consideration shall also be given to preserving natural drainage methods and natural topography and landscape. Special consideration shall be given to providing special screening, landscaped or natural buffers, or landscaped berms where developments abut non-compatible land uses in accordance with the LDC. Special consideration shall be given to conformance with streets and driveway spacing Standards in accordance with the LDC and this document. Special consideration shall be given during the development design process to not only make the site accessible to the public through the use of handicap parking and ramps, off-site sidewalks/bikeways, and interconnection of adjacent sites; but also where possible encourage the use of alternative mode of travel by providing transit stops and shelters, on-site sidewalks/bikeways, bike racks, and signed and marked reserved employee ride share parking spaces.

3.01.05 Record Drawing Requirements

All “as-built” information submitted to the engineer shall be sufficiently accurate, clear and legible to satisfy the engineer that the information provides a true representation of the improvements constructed. Upon completion of construction, the contractor shall submit to the engineer of record complete sets of “as-built” construction drawings as required for submittal and approval. These drawings shall be marked to show “as-built” construction changes and dimensioned locations and elevations of all improvements and GPS data table and shall be signed and sealed by a Florida registered land surveyor. The following information shall be included in the “as-built” submittal at a minimum:

A) Sanitary Sewer:

1. Top elevation of each manhole frame and cover.
2. Invert of each line entering and leaving each manhole/structure.
3. Length of each run of main between manholes (center to center).
4. Actual grade of pipe between manholes.
5. Locate all service wyes from downstream manhole with depth at lot line and distance from the main line.
6. Field measurements for location from permanent visible objects all fitting/accessories not visible from the surface (minimum two point ties) (including clean-outs).

B) Storm Drainage:

1. Top elevation of each manhole frame and cover/grate as well as all other structures (headwalls, control structures, etc.).
2. Invert elevation of each line entering and leaving each structure, including underdrain pipes.
3. Inverts of all mitered end sections.
4. Actual grade of pipe between the structures.

5. Invert elevation and two horizontal ties from permanent visible objects to all storm stub-outs, underdrain cleanouts, yard drains, etc.

C) Water and Reuse System and Force Main

1. Actual lengths between all fittings and valves along the main run.
2. Locate with measurements from permanent visible objects all fittings/accessories not visible from the surface (minimum two point ties).
3. As-built information on water systems shall include locations of all fire hydrants, water services, blow-off assemblies, and top of pipe elevations at all fittings and at a minimum of 100 feet spacing along the length of the mains.
4. All sample points shall be shown in the “as-built” drawings and shall be sequentially numbered throughout the entire project without duplication between plan sheets. The numbering shall conform with those indicated in the samples for fdep clearances.

D) Utility Crossing Separation Information for that on the Plans Verifying:

1. Size and material of crossing pipes.
2. Top elevation of bottom pipe.
3. Bottom elevation of top pipe.
4. Finish surface elevation over utility crossing.

E) Pavement Grades and Drainage Patterns

1. Pavement profiles and critical points shall have verified elevations indicating the constructed finished grade.
2. Drainage patterns indicated by the design drawings shall have verified spot elevations indicating the finished grade.

F) GPS Data:

The x, y and (z) location based on the coordinate system Florida east zone state plane coordinate feet NAD 83, of all manholes (rim elevation), lift stations (rim elevation), cleanouts (grade), sample points (grade), fittings (center of pipe) and meter boxes (grade), etc. Shall be clearly shown. Acceptable position accuracy shall be sub-meter or better for compatibility with global positioning system (GPS) equipment.

The GPS data shall be provided in an asset table incorporated as a section of the final “as-built” drawings and shall include the headings as follows:

Asset #; utility system (water, sewer, reclaimed water, force main, stormwater); description; X-Coord.; Y-Coord.; Z-Coord.

Asset #	Utility System	Feature	X-Coordinate	Y-Coordinate	Z-Coordinate
001					
002					
003					
004					

Section

3.02

STREETS AND OTHER PAVEMENTS

3.02.01 General

The design character, width, grade and location of all streets and bridges shall conform to the Standards in this Section and shall be considered in their relation to existing and planned streets, to topographical conditions, to public convenience and safety, and in their appropriate relation to the proposed uses of the land to be served by such streets. Whenever not modified by these Standards, the guidelines of the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, (FDOT), and the Standards of the American Association of State Highways and Transportation Officials, referred to therein, shall be the minimum acceptable standard.

3.02.02 Minimum Standards For Right-of-Way Improvement

- A) Sidewalks/Bikeways: It is the intent of the City that every new residential lot or non-residential development shall construct its portion of the city wide pedestrian/bikeway system. If a variance to these provisions is granted, the Owner/Developer shall execute a sidewalk agreement with the City to ensure the future installation of the facilities.
- B) Driveway Approaches: Driveway approaches shall be 3,000 psi concrete, at least 6 inches thick, with break and/or expansion joints at property line. Sidewalk/bikepath shall be constructed with the driveway section. Expansion joints shall be installed at the tie-in point with sidewalks and curbing. All installations to maintain a slope of $\frac{1}{4}$ inch per 1 foot horizontal.
- C) Streets: Abutting rights-of-way shall be paved as hereinafter specified.
 - 1) Design Specifications

Streets shall be classified based on the definitions and with consideration of vehicle trip generation ratios unless superseded by alternative ratios adopted by the City. Where the City has adopted a higher classification than the classification based on projected traffic volumes, the higher classification shall be used. All streets shall be designed in accordance with the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (FDOT), LDC, and the following minimum specifications, except that greater requirements must be met when imposed by an agency having jurisdiction of a particular road. Horizontal alignments shall be based on a minimum design speed of 35 MPH except for local residential streets. Local residential streets shall have a minimum back of curb horizontal curvature of 50 feet without superelevation.

2) Minimum Street Grade Specifications
Percent Grade of Roadway

Table 3-1			
Centerline:	Arterial Street	Collector Street	Local Street
Maximum	10%	10%	10%
Minimum	0.50%	0.50%	0.50%

Slopes less than 0.50% shall require special approval by the City Engineer.

The minimum cross slope shall be 2% except in necessary transitions.

3) Intersection Design

- a) Streets and driveways shall be laid out to intersect as nearly as possible at right angles (90°) or radial, however, in no case shall the angle of the intersection be less than 60° . Multiple intersections involving the juncture of more than 2 roadways and driveway approaches shall be prohibited. The gradient within 100 feet of the intersection and driveway shall not exceed 3%. The design shall comply with the Specifications contained in the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (FDOT).
- b) A minimum sight distance of 250 feet from any intersection shall be maintained on the intersecting streets. Greater distances may be required to satisfy FDOT and the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (FDOT). In all cases, clear sight distance from any intersection shall be maintained on the adjoining streets.

4) Radii at Intersections

The minimum intersection radii of back of curb at all typical intersections approximating a right angle shall be as follows:

Table 3-2	
Category	Minimum Radius
Local to Local - Residential	25'
Local to Local - Non-Residential	35'
Local to Collector	35'
Local or Collector to Arterial	50'
Collector to Collector	30'

A deceleration lane and taper shall be required as outlined in ARTICLE 24 of this Manual. A minimum radius of 30 feet shall be provided at all intersecting right-of-way lines.

The design and construction of larger or smaller radii maybe required by the City Engineer based upon the type of design vehicles and design speed of the roadway.

5) Pavement Specifications

Improvements designed as above shall be provided as required by the following schedule:

- a) For residential developments, improvements shall conform to STANDARD A., For Standard configuration see, Typical City Details attached as part of this Manual.
- b) For all other developments, improvements shall conform to STANDARD B., For Standard configuration see, Typical City Details attached as part of this Manual
- c) Where the proposed development includes or abuts an existing full or half right-of-way street, said street shall also be improved as required to conform to the following Standards.
- d) When a modification to the width of an existing roadway is necessary, a minimum of 1 1/2 inch of asphaltic concrete overlay with leveling shall be installed the full length and width of the entire affected section of the adjacent roadway.

STANDARD

TABLE 3-3		
A	B	1) Grading and centerline gradients shall be provided on the plans and as approved by the City. (See Section 3.02)
		2) Curb and gutters shall be provided as follows:
A		a) Standard 24 inch wide Miami Residential or FDOT Type F curb and gutter.
	B	b) Standard 24 inch wide FDOT Type F curb and gutter.
A	B	c) Standard Type A concrete curb shall be used on center medians and islands.
A	B	d) Density under curb and gutter shall be to a minimum density of 98% of the maximum density determined by AASHTO T-180
A	B	3) Subbase shall be approved by the City Engineer as being suitable material prepared in accordance with Standards established by this Manual. Twelve inches shall be the minimum thickness unless otherwise stated in this ARTICLE.
		4) Pavement base shall be improved as follows:
A	B	a) Arterial Streets: 10 inch compacted limerock / soil cement
	B	b) Collector and Commercial Streets: 10 inch compacted limerock / soil cement
A		c) Local Streets: 8 inch compacted limerock / soil cement
		Note: an equivalent type or alternate base material may be approved by the City Engineer if field situation dictates.
		5) Wearing surface shall be improved as follows:
A	B	a) Arterial, Collector and Commercial Streets: 1-¾ inch structure course and 1 inch friction course. Non-skid surfaces may be required. FDOT-applicable asphaltic concrete shall be used unless otherwise approved by the City Engineer
A	B	b) Local Streets: Minimum of 2 inch asphaltic concrete surface course or the equivalent as meeting Standards established by the City. Non-skid surfaces may be required. FDOT-applicable asphaltic concrete shall be used unless otherwise approved by the City Engineer. City Engineer may require surface treatment to be applied in two (2) layers with final top layer being installed after build-out.
A	B	6) Grassing and mulching of flat areas, or sodding of swales, parkway medians, percolation areas, and planting strips shall be in accordance with City Standards. In no case shall mulching of driveways be permitted.

A	B	7) Street name signs in accordance with City specifications and appropriate block numbers shall be installed on all public streets at all intersections. The street name signs will be installed by the City upon notification from the Developer in writing that the roads are complete. The Owner/Developer shall order and pay for all such signage, including installation cost, prior to issuance of any building permits. The signs shall be in place prior to the City's final acceptance of the roadway.
A	B	8) Street lighting shall be installed at the expense of the Developer, and includes payment of 2 years worth of up-front fees. All utilities are to be installed underground. Poles shall not be placed in medians or directly adjacent to the roadway or within sidewalks/bikeways. Wherever practical, poles shall not be installed immediately adjacent to sidewalks/bikeways. The poles shall be placed either in an easement or adjacent to the right-of-way line to allow a minimum 5 foot clearance from the nearest edge of pavement. Location modification shall be specifically approved by the City Engineer prior to installation.
A	B	9) Traffic control devices such as signs and pavement markings and traffic signalization devices shall be installed by the Owner/Developer at the Owner's/Developer's expense within the project area and on abutting streets and highways in accordance with the MUTCD and as approved by the City Engineer. Modification requests shall be specifically approved by the City Engineer prior to installation.
A	B	10) For two years from City Commission's project acceptance, the Owner/Developer shall warranty all constructed facilities in public rights-of-way and easements by Surety document approved by the City being either a Letter of Credit or Cash.

3.02.03 Additional Right-of-Way and/or Pavement Width

Whenever any street shows future need for improvement within the area to be developed, the appropriate right-of-way or pavement width, in conformance with minimum City Standards shall be required to be dedicated as outlined in the LDC.

Half streets and substandard rights-of-way and pavement widths shall be prohibited. Where a previously dedicated incomplete or substandard street, improved or unimproved, abuts or is within a tract to be developed, the remainder of the right-of-way shall be dedicated and the full street improved according to City Standards.

3.02.04 Access

Vehicular access shall be provided as follows and as outlined in the LDC.

- A) Minimum number of access points to adequately serve the development without decreasing the safety and capacity of the public rights-of-way. Joint-use driveways may be required by the City. All developments shall also be evaluated by the City of Ocoee Fire Rescue Department for emergency access.
- B) In order to provide ease and convenience for ingress and egress to private property, with maximum safety and the least interference to the traffic flow on public streets, the number and location of driveways for roadways with classification of collector and above, shall be regulated by the dedication of access rights to the City in accordance with the LDC.
- C) Deceleration and acceleration lanes, left-turn lanes, bypass lanes, and tapers are required on all roads with a classification of collector and above unless exempted by the City Engineer. Median relocations and modifications or other design features may be required at the discretion of the City Engineer to protect and maintain the safe and efficient operation of the public rights-of-way.
- D) All buildings, when constructed, shall be accessible to fire department apparatus by way of access roadways with an all weather driving surface of not less than 20 feet of unobstructed width and a turning radius of 40 feet capable of supporting the imposed loads of fire apparatus. This access shall also have a minimum vertical clearance of 13 feet 6 inches. All hydrants shall remain serviceable during project construction, unless otherwise approved by the City of Ocoee Fire Rescue Department.
- E) Driveways shall be installed as depicted in ARTICLE 25 of this Manual.

3.02.05 Paved Access to Nearest Paved Public Road

A development shall abut or have as its primary access onto a street designed and paved to standard requirements of the authority having jurisdiction (City, County, State). The Owner/Developer shall install or upgrade the street from the entrance of the development to the nearest public paved road of proper functional classification as determined by the City Engineer.

3.02.06 Commercial/Industrial Driveways and Internal Circulation

- A) Vehicular circulation must be completely contained within the property. Vehicles located within one portion of the development must have access to all portions without using the adjacent street system and be capable of accommodating the vehicles associated with the development.

- B) Acceptable plans must illustrate that proper consideration has been given to the surrounding street plan, traffic volumes, proposed street improvements, vehicular street capacities, pedestrian movements, and safety.
 - 1) Driveways directly accessing thoroughfares or accessing local streets adjacent to thoroughfares shall meet the design requirements of the LDC.
 - 2) Driveways accessing other local streets shall not intersect or be nearer than 50 feet (20 feet for residential) to the adjacent driveway without the approval of the City Engineer. Where possible, driveways shall be located a minimum of 200 feet (50 feet for residential) from public intersections. Measurement is based on nearest edge of pavement to nearest edge of pavement.
- C) Deceleration lane and tapers shall be required as outlined in ARTICLE 24 of this Manual.
- D) Appropriate special radii shall be designed, subject to the approval of the City Engineer for other than right-angle (90°) intersections.

Section 3.03 EASEMENTS

Easements shall be centered on rear or side-lot lines where necessary. Easements shall be provided as determined by the LDC. “Vehicular Access Easements” shall be located as approved by the City Engineer.

Where necessary for safety and convenience, “Construction Easements” of suitable width shall be required as determined by the City. No public easement shall be occupied without first obtaining a Right-of-Way Utilization Permit. When encroachment is desired, the applicant shall contact all utilities doing business within the City, prior to the City granting permit.

“Joint-Use Access Easements” shall be required, as necessary, to provide safe and adequate access to a site and for the protection of the capacity and safety of the adjacent roadway.

Any off-site easements, needed to make the system function, shall be included in the proposal for development and made a criteria for plan approval.

Easements for all facilities must be shown on construction drawings and approved by the City. The easement documents and rights-of-way deeds must be executed, accepted and recorded by the City. All recording fees shall be paid to the City prior to recording in the Public Records or issuance of a building permit. All easements for private developments shall be provided at no expense to the City.

Section 3.04 SURVEY MONUMENTS

Permanent Reference Monuments (PRMs) and Permanent Control Points (PCPs) shall be placed as required by Florida Statutes. A letter from a Florida registered Land Surveyor certifying that all monuments, PCPs, PRMs are in place as of the date of the project acceptance shall be required of all developments. The Contractor shall be responsible for re-establishing all disturbed survey markers and/or monuments. All survey work shall be performed in accordance with pertinent memoranda and shall comply with Minimum Technical Standards, as adopted by the Florida Board of Land Surveyors, pursuant to Florida Statutes.

Section 3.05 CURBS AND GUTTERS

All streets shall be paved and drained in accordance with FDOT Standard curb-and-gutter (or Miami curb in residential areas), unless otherwise specifically approved by the City Engineer. Curbing shall be used for stormwater conveyance, traffic control channelization, and the protection of landscaped areas.

The width of the curb and gutter shall be a minimum of 24 inches and shall be as outlined by this Manual. Simple vertical curbing within rights-of-way will not be acceptable to the City. Approved mountable median curb, of the FDOT type, may be used, as approved by the City Engineer. All curbing designed to handle water shall incorporate an approved gutter design.

No water valve boxes, meters, portions of manholes, or other appurtenances of any kind relating to any underground utilities shall be located in any portion of a curb-and-gutter section. The minimum allowable flow line grade of curbs and gutters shall be 0.40% except in intersections where flatter grades shall be allowable. Cross-street valley gutters shall not be allowed.

Section 3.06 STORMWATER MANAGEMENT

3.06.01 General Requirements

Protection of water resources is critical to the public health, safety, and welfare. Innovative approaches to stormwater management shall be encouraged and the concurrent control of erosion, sedimentation, and flooding shall be mandatory. No site alteration shall cause siltation of wetlands, pollution of downstream wetlands, or reduce the natural retention or filtering capabilities of wetlands.

3.06.02 Stormwater Management

A complete stormwater management system shall be provided in all areas of the project and for handling stormwater runoff that flows into or across the project area from the outside, without undesired additional flooding of any other land. The system shall be designed for long life, low maintenance cost, and ease of maintenance by normal maintenance methods. Soil types shall be considered and full development of the basin assumed for selection of proper runoff coefficients within the basins involved. Refer to ARTICLE 34 of this Manual for design specifications. Should the proposed development area contain an existing natural watercourse drainageway, channel, etc., such natural watercourse and the vegetation inherent therewith shall be maintained and the proposed development designed so as to preserve same unless otherwise permitted.

3.06.03 Guidelines for Berms

Slopes are preferred to be 5:1 or less on berms and other applications. Slopes 3:1 shall be the maximum permissible slope, unless specifically addressed elsewhere in this Manual, but shall be stabilized with sod or other stabilizing material. Retaining walls require the approval of the City Engineer or his Designee and must be signed and sealed by the Engineer for any walls exceeding 2 feet in height. Where berms or slopes are specifically addressed in other ARTICLES of this Manual, they shall conform to that ARTICLE.

Section 3.07 DECORATIVE ENTRANCES

Where an Owner/Developer is specifically permitted by the City to construct decorative landscaping within the right-of-way of any street, the Owner/Developer shall provide a maintenance agreement acceptable to the City for perpetual maintenance of such landscaping and shall provide for removal of such landscaping on order by the City for cause. The City shall not accept liability or responsibility for maintenance of landscaping in rights-of-way and shall be held harmless for any damage done to same in work performed by the City in such right-of-way. The design and maintenance of the landscaping shall comply with the City's set back regulations for fixed object hazards and for driver clear sight distance. Private signs are prohibited within public rights-of-way.

A minimum sight distance per the LDC must be maintained at all public road intersections including those with driveways. Structures are prohibited in the rights-of-way except as permitted by the City Engineer in accordance with the LDC.

Section 3.08 OWNER/DEVELOPER CONTROL DURING CONSTRUCTION

The Owner/Developer shall be required during the entire construction period to control, regulate, and maintain the development in such a manner as to prevent the accumulation of trash and debris, resulting from the Owner's/Developer's construction activities, on both the site and adjacent public and private property, which would detract from the enjoyment and pleasure in the natural scenic beauty of the City, and, in turn, injuriously affect the economic well-being of the public. The use of residential lots in nearby developments or Substantially Completed phases of the same development, under the ownership and control of said Owner/Developer, for the bulk storage of construction materials substantially unrelated to the development of those residential lots is prohibited. A development shall be deemed to be Substantially Completed when 70% of the planned units are completed and ready for occupancy, or are actually occupied.

Section 3.09 EROSION CONTROL

All development shall follow erosion control methods as described in this section, FDOT Design Standards, and FDEP Stormwater, Erosion and Sediment Control Program and Manual.

Seeding, mulching, sodding, and/or other acceptable methods shall be used to prevent erosion during all construction activities per requirements as specified in the LDC.

The Owner/Developer of commercial and residential lots shall be required to maintain curbs and gutters free of accumulations of sand and earth. Temporary siltation basins may be required during construction. Maintenance shall be provided by the Owner/Developer for the 2 year period of the maintenance period and for each lot until final inspection is passed. All actions to prevent erosion or pollution shall be done in accordance with this Manual.

3.09.01 Stormwater Pollution Prevention Plan (SWPPP)

If required by the City Engineer, the SWPPP, details, and calculations shall document all the measures necessary to limit the transport of sediments outside the limits of the project to the volume and amount that existed prior to the commencement of construction. This condition shall be satisfied for both the total anticipated construction period at a minimum and for the 2.3 year frequency, 6 hour duration storm event. Provisions must be made to preserve the integrity and capacity of check weirs, sediment basins, slope drains, grading patterns, etc. required to meet this provision throughout the life of the construction. Submittal of a Stormwater Pollution Prevention Plan shall comply with the requirements of the FDEP and SJRWMD.

3.09.02 Stockpiling Material

No excavated material shall be stockpiled in such a manner that directs runoff directly off the project site or into any adjacent water body or stormwater collection system. No building construction or landscaping materials shall be stored within public rights-of-way or on the streets.

3.09.03 Exposed Area Limitation

The surface area of open, raw, erodible soil exposed by clearing and grubbing operations or excavation and filling operations shall not exceed 10 acres. This requirement may be waived for large projects with an erosion control plan, which demonstrates that opening of additional areas will not significantly affect off-site deposit of sediments.

3.09.04 Inlet Protection

Inlets and catch basins shall be protected from sediment laden storm runoff until the completion of all construction operations that may contribute sediment to the inlet.

3.09.05 Temporary Seeding

Areas opened by construction operations that are not anticipated to be dressed and receive final grassing treatment within 30 days shall be seeded with a quick growing grass species which will provide an early cover during the season in which it is planted, and will not later compete with the permanent grassing. The rate of seeding shall be a minimum of 30 lb per acre.

3.09.06 Temporary Seeding and Mulching

Slopes steeper than 6:1 that fall within the category established in 3.09.05 above, shall be mulched using a minimum of 2 inches, loosely measured, mulch material, cut into the soil of the seeded area to a total depth of 4 inches.

3.09.07 Temporary Grassing

The seeded or seeded and mulched area(s) shall be rolled and watered as required to assure optimum growing conditions for the establishment of a good grass cover.

3.09.08 Temporary Regrassing

If, after 14 days, the temporary grassed areas have not attained a minimum of 75% good grass cover, the area will be reworked sufficiently to establish the desired vegetative cover.

3.09.09 Maintenance

All features of the project designed and constructed to prevent erosion and sediment shall be maintained during the life of the construction so as to function as they were originally designed and constructed.

3.09.10 Permanent Erosion Control

The erosion control facilities of the project shall be designed to minimize the impact on off-site facilities. All stormwater discharge from the project limits shall be routed through detention basins to trap suspended sediments. Discharge facilities from these basins shall be provided with a skimming device to trap floatable debris.

3.09.11 Permanent Seeding

All areas which have been disturbed by construction shall, as a minimum, be fertilized and seeded. The fertilizer shall be of 12-8-8 proportions and shall be uniformly spread at a rate of 400-500 lb per acre and mixed with the soil to a uniform depth of 4 inches. Included with the fertilizing operation will be the application of amendments, if necessary, such as dolomitic limestone or aluminum sulfate to correct the pH factor to within the limits of 6.0-7.0. The grass seed shall be uniformly spread at the rate of 100 lb per acre while the soil is moist. The grass seed mixture shall be of 20 parts bermuda and 80 parts bahia, with the addition of 30 parts rye in the winter season.

3.09.12 Permanent Seeding and Mulching

In addition to the minimum requirements of 3.09.11 above, slopes of from 6:1 to 4:1 inclusive shall be mulched using a 2 inches, loosely measured, mulch material cut into the soil of the seeded area to a total depth of 4 inches.

3.09.13 Permanent Sodding

All retention/detention basins shall be solid sodded within their limits. All exposed areas within public rights-of-way shall be solid sodded. Other areas with slopes steeper than 4:1 shall be solid sodded.

3.09.14 Strip Sodding

Strip sod shall be placed adjacent to all curbs, walks and pavements to the dimensions indicated in the Typical Cross-section provided in the approved plans.

3.09.15 Regrassing

All grassed areas shall be maintained to assure a good stand and sufficient ground cover to minimize erosion. If, after 60 days, an adequate ground cover has not been established, the area will be regrassed.

3.09.16 Additional Fertilization

Grassed areas not accepted within 90 days of their completion shall be refertilized at an application rate of 250 lb per acre.

Section **3.10 PHASED DEVELOPMENT**

Each phase of any development shall be capable of standing on its own as if subsequent areas planned for development are not developed.

Residential Developers and Builders shall follow the erosion and sediment control principles and practices above and the following during construction on individual lots:

- A) Silt fences/barriers shall be installed on lot lines adjacent to pond, natural, and conservation areas to minimize erosion. Silt fences/barriers shall also be installed as needed to prevent erosion/flooding of adjacent built-out lots and streets.
- B) During construction, streets shall be kept free of excessive dirt and construction debris. Hay bales, sand bags or other approved erosion and sediment control devices shall be installed and maintained at stormwater inlets. Streets shall not be used for storage of construction materials. Containers shall be provided for holding trash and construction debris.
- C) Prior to final acceptance, erosion and sediment control provisions (sodding and seeding/mulching) on adjacent vacant lots shall be restored. Erosion and sediment control precautions shall be taken where erosion and/or washouts can be anticipated, particularly along side lot lines. All construction debris and excess dirt shall be removed from adjacent vacant lots (including those across the street).

Section **3.11 TRAFFIC CONTROL DURING CONSTRUCTION**

The Owner/Developer shall prohibit public traffic from using newly constructed roadways until they are accepted and approved to be opened by the City Engineer or his Designee. Barricades and other safety devices shall remain in place until such time as deemed appropriate to remove them, or until such time as the hazard to health and safety of the general public has been reduced to minimal acceptable standards.

The Owner/Developer shall be required to provide work zone traffic control during construction within the public rights-of-way until approval is given by the City Engineer or his Designee to remove the controls as established in accordance with the MUTCD.

Section**3.12****TRAFFIC SIGNAL PRE-EMPTION SYSTEM**

All traffic signals shall be equipped with an Opticom Traffic Signal Pre-Emption System. The system shall be usable by an emergency vehicle approaching from all intersection directions. Before installation, the system plans shall be reviewed and approved by the City of Ocoee Fire Rescue Department and Orange County's Traffic Engineering.

ARTICLE 4

RIGHT-OF-WAY UTILIZATION

Index	4.01	<u>GENERAL</u>
	4.02	<u>DEFINITIONS</u>
	4.03	<u>EXCLUSIONS</u>
	4.04	<u>GENERAL REGULATIONS</u>
	4.05	<u>RESTORATION AND MAINTENANCE</u>
	4.06	<u>UTILITY ACCOMMODATION</u>
	4.07	<u>INSPECTION</u>
	4.08	<u>OPERATIONAL SAFETY</u>
	4.09	<u>EXISTING USES</u>

[BACK TO TABLE OF CONTENTS](#)

Section	4.01	<u>GENERAL</u>
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The purpose of this ARTICLE, in the interest of public health, safety and welfare of the citizens and inhabitants of the City of Ocoee, Florida, is to control, by the issuance of Right-of-Way Utilization Permits, the utilization of the public rights-of-way and public easements lying within the City of Ocoee. It is the intent of this ARTICLE to promote good engineering practices which will assure the maximum utilization of the public rights-of-way and public easements by all the citizens, with the lowest life cycle cost to all due safety, operation and maintenance. Right-of-way Utilization Permits shall be obtained as prescribed in the City of Ocoee Code of Ordinances. All activities within the jurisdiction of this Manual shall be reported to all Utilities in the area at least 48 hours prior to commencement. Permits from other entities may be required in addition to the City permit.

Section	4.02	<u>DEFINITIONS</u>
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The term “right-of-way” and the term “easement” as used in this ARTICLE, unless otherwise designated, shall be deemed public rights-of-way and public easements.

Section	4.03	<u>EXCLUSIONS</u>
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All construction and maintenance performed within the public rights-of-way and public easements lying within the City of Ocoee, Florida, unless specifically exempt, are within the purview of this ARTICLE, regardless of size or extent. Exclusion from any part in this ARTICLE does not provide exclusion (applicability of) of any other provisions.

Pre-application meetings are recommended and pre-Construction conferences are mandatory between the Owner/Developer, their Engineer, all utilities, and the City Staff when City facilities or improvements to be dedicated to the City are involved.

In all cases, full consideration shall be given to sound engineering principles and economic factors. Final determination of the types of facilities permitted shall be based on a cost/benefit analysis of the feasible alternatives. Consideration shall be given to aesthetics by all right-of-way users avoiding unnecessary appurtenances.

All construction and maintenance shall be performed with proper shoring, barricades, and maintenance of traffic signage in accordance with the MUTCD, the regulations of the Florida Industrial Safety Board, and the FDOT Safety Manual. All street closures will be restricted to the limits of rights-of-way with necessary traffic control devices and markings. A Right-of-Way Utilization Permit shall be required.

Shoring shall be required where necessary to protect existing pavement, and must be properly protected and removed.

All side drains, side ditches and storm sewers shall be referenced as to grade and location prior to construction.

Where direct burial of utilities is not required, only single-pole support systems shall be permitted within the rights-of-way. Any exception must be amply justified and approved by the City Engineer. Where it is necessary to place aerial crossings which may interfere with traffic, careful planning of work with regard to the safety of vehicular traffic is mandatory. No temporary supports shall be allowed closer than the minimum clearance unless they are incorporated with a suitable barrier system. Such temporary construction shall be completed in the minimum time possible as approved in the Permit.

Where feasible, all longitudinal underground facilities shall be placed outside of the pavement of main-traveled lanes. Where encasement is used, the encasement pipe shall have strength equal to or exceeding the carrier pipe. Encasement shall be in accordance with ARTICLE 26 of this Manual. PVC pipe used in roadway crossings for use as non-pressure conduit intended for direct burial, or concrete encasement, unless otherwise specified, shall have a minimum pipe stiffness of 120 psi at a deflection of 0.2 inch, when tested in accordance with ASTM D-2412. Casing shall normally be required for paved roadway crossings of underground utilities where the carrier is of insufficient strength due to composition or depth of cover in accordance with this Manual.

All gas piping to be maintained by public and private utilities must comply with the Federal Standards as listed in the Florida Public Service Commission Rule 25-12.05, as amended by Order No. 5221, with any subsequent modifications thereto.

All jack and bore crossings shall be a continuous operation at each location at the proper location and depth. Any deviation from the above will be sufficient grounds for work stoppage, plugging the line with concrete, and replacing the line at the proper location. All operations shall be in accordance with ARTICLE 26 of this Manual.

Open cutting of existing roadway pavement shall generally not be allowed, but may be considered under one or more of the following conditions upon the City Engineer's approval:

- A) Subsurface obstructions.
- B) Limited space for jacking pits.
- C) Condition of roadway surface, including imminent resurfacing and rebuilding.
- D) Where facility design prohibits.
- E) Extreme economic hardship.

In any analysis of a request for open cutting, primary consideration shall be given to the safety and convenience of the public. Permitted open cuts shall be in accordance with the Typical City Details attached as part of this Manual. The City Engineer will consider use of other methods where conditions warrant.

Where an open cut is considered, a smooth all-weather surface must be provided and maintained all times. Permanent replacements of the temporary patch shall be made within 5 days of completion of the crossing. Proper repairs of open cuts shall be in accordance with this Manual.

The City shall establish control of access based upon location, geometric design, and traffic operations controls (in accordance with this Manual), all of which shall encourage safe and efficient operations, as well as provide suitable and sufficient access.

Any construction and maintenance performed within the rights-of-way and public easements of the City that encroach or affect in any way a primary drainage canal, lake, drain well, and/or drainage easement or right-of-way under the jurisdiction of Orange County shall also obtain a Right-of-Way Utilization Permit from the County complying with the existing ordinances of Orange County, Florida and its Right-of-Way Utilization Regulations.

All public rights-of-way and public easements shall be restored to their original condition or better, in keeping with this Manual, and in a manner satisfactory to the City Engineer.

All excavated material in excess of the quantity required for backfill, and unusable material shall be disposed of at the Permittee's expense, and not placed within the limits of the public right-of-way or easement unless so directed by the City Engineer or his Designee.

At such locations where City signs and reflectors will interfere with proposed construction, the Permittee or their Consultant shall notify the City 48 hours in advance of starting work. All signs and reflectors will be removed or relocated only by City forces. Any signs or reflectors damaged, destroyed, removed, or relocated shall be replaced at the expense of the Permittee. No private signs of any type shall be permitted within the right-of-way.

Sodding operations are to begin as soon as fine grading and weather conditions permit, as directed by the City. Any private yards or part of the right-of-way in front of private property that has a grass mat shall be resodded with like sod.

All debris shall be removed and properly disposed of by the Permittee at the Permittee's expense. Dust control shall be mandatory.

All vegetation shall be provided the maximum protection as required by the LDC. The indiscriminate cutting of trees or disfiguring of any feature of scenic value, including methods such as herbicide treatment, shall not be permitted. Trees and/or shrubs destroyed during construction are subject to replacement at the Permittee's expense as directed by the City. The necessary trimming or cutting of trees by utility companies, in the interest of public safety or continuity of utility service, shall not be considered indiscriminate where such utilities cannot bypass the obstruction without violating the clear roadside policy. This shall not be construed to mean that existing pole lines must be relocated to comply with the above. City tree removal permits shall be obtained from the City Building Department.

All landscaping within public rights-of-way and public easements shall comply with the following provisions:

- A) The City Engineer or his Designee may request line of sight calculations and details to determine the permissibility of various landscaping and signage in areas of ingress and egress per the requirements of this Manual.

- B) In order for the City to allow the non-City installation of right-of-way or easement landscaping, a statement in writing as to who will be responsible for the maintenance of the project including watering, fertilizing, pruning, etc., shall be required. This statement shall come from the adjacent property Owner/Developer, the appropriate homeowners association, or civic organization.
- C) The Permittee shall not hold the City responsible for any damage to the plants during subsequent right-of-way construction.
- D) Landscaping within State and County rights-of-way within the limits of the City of Ocoee shall comply with Orange County or FDOT highway beautification and planting regulations and the City of Ocoee requirements.
- E) Plants between 2 and 7 feet above the ground, in a median island within 100 feet of a crossover nose, shall provide a clear drivers sight distance. Conditions may require the above 100 foot length to be extended for safety considerations.
- F) A 4 foot mowing strip shall be maintained between the plants and the curb or sidewalks/bikepaths. If plants are desired in this mowing strip they shall be kept under 24 inches.
- G) No rock boulders, utility facilities, stationary signs, or above ground monuments shall be allowed in the medians.
- H) Persons and equipment maintaining the project are to carry out their work in such a manner as not to obstruct vision or traffic flow.
- I) Plantings shall be maintained at all times to prevent being a hazard in the safe operation of a vehicle, which includes the sight distance of drivers.
- J) Trees planted within the right-of-way on high speed (50 MPH and above) and high volume roadways shall be 30 feet from the edge of the pavement or at the right-of-way line. Each location will be reviewed for any special requirements by the City.
- K) Sprinkler heads and irrigation systems installed adjacent to public roadways and sidewalks shall be designed to insure public safety and shall not spray water over or on the roadway or sidewalk area. They shall not be operated during high pedestrian or vehicular travel times. On non-curbed streets, the sprinkler heads shall be located adjacent to the right-of-way line or on private property to prevent damage from any vehicles, parked or otherwise.

Section 4.06 UTILITY ACCOMMODATION

4.06.01 General

The placement of utilities within the public rights-of-way and public easements shall be placed in accordance with all applicable Codes, and current industry standards. All accommodations within the FDOT maintained right-of-way shall be in accordance with FDOT's Utility Accommodation Guide. All accommodations within the Orange County maintained roadways shall be in accordance with Orange County regulations. All other installations within the City maintained roadways shall be in accordance with this Manual.

As far as mechanically possible, the accommodations shall be followed for public right-of-way and public easement utilization within the City with the exception above.

All utilities are to be installed in accordance with the latest editions of the Federal Standards, as listed in the Florida Public Service Commission Rule 25.12.05, as amended by Order No. 5221 issued by the Commission on September 17, 1971, with any subsequent modifications thereto, the National Electrical Safety Code, FDOT's Safety Manual, MUTCD, LDC, this Manual, and any City Codes and Ordinances.

The criteria identified in this ARTICLE shall not be applied to a minor segment of an existing utility installation in such a manner as to result in misalignment of the installation or adjustment of the entire installation.

4.06.02 Light and Utility Poles

Light and utility poles shall be at least 18 feet from edge of pavement or at right-of-way line. Poles are permitted to within 12 feet from edge of pavement, provided a frangible base is used or if poles are placed behind a barrier. A minimum distance of 6 feet shall be required from the edge of pavement on deceleration and acceleration lanes. Where the design permits, a 14 foot clearance from finished grade shall be used. In curb and gutter sections, poles shall be at the right-of-way line with 4 foot minimum from face of non-mountable curb to front of pole. Edge of pavement does not include shoulder pavement.

In exposed areas, frangible or breakaway poles and light standards shall be considered to the extent practical. Where location is not exposed, consideration can be given to other type standards. Where feasible and practical, luminaries shall be attached to existing utility poles which meet offset criteria. For the purpose of this ARTICLE, frangible base poles will be accepted as bases in accordance with the FDOT Index Number 9623 (including later revisions), approved slip-type bases, or aluminum poles with an 8 inch outside diameter and 0.188 inch wall thickness, mounted on cast aluminum flange base, alloy 356-T6 and 356-F.

Projects where the 4 foot minimum offset would place the utility or other obstruction in substantial conflict with the sidewalk/bikepath or an unreasonable conflict with requirements of the National Electrical Safety Code would be created (in the case of power poles), and other alternatives are deemed impractical, the minimum may be reduced to 2½ feet from back of curb. Each case where this deviation is proposed must be supported on an individual basis and approved by the City Engineer or his Designee.

4.06.03 Mailboxes and Newspaper Boxes

Non-single family mailboxes, newspaper boxes, etc. shall be placed on private property or at the right-of-way line where possible. Poles may be located up to 6½ feet from right-of-way line, provided that they are at least 18 feet from edge of pavement. In curb and gutter sections, poles shall be at the right-of-way line with 4 foot minimum from face of non-mountable curb to front of pole. Edge of pavement does not include shoulder pavement. Poles shall not be permitted in medians, except for temporary construction purposes where incorporated within a suitable barrier system. Privately owned boxes, etc. are placed at the Owner's expense and liability, and when in City right-of-way shall be removed/relocated if directed to do so by the City Engineer.

Single family mailboxes shall be constructed and/or installed in a manner that does not endanger the public. U.S. Postal regulations shall be considered.

4.06.04 Other Structures

Devices such as signal-strain poles, above ground enclosures, and other items whose construction and size would cause extensive damage to a vehicle if struck are to be located according to the standards for utility poles.

4.06.05 Underground Installations

Underground utility installations shall have a minimum vertical clearance of 36-inches below the top of roadway pavement or top of ground, including ditch grades.

4.06.06 Aerial Crossings

Aerial crossings shall be in accordance with the National Electrical Safety Code, and a minimum of 18 feet over roadways and driveways. Crossing shall not interfere with existing or planned signal installation.

The roadside clearances for above ground utility facilities shall be consistent with those clearances applicable to other obstacles on the type of highway involved, reflecting good engineering and economic considerations.

4.06.07 Excavation

Where possible, excavation shall not be allowed within 4 feet of the edge of pavement. This shall necessitate that the utility be placed a sufficient distance from the pavement. Where this requirement imposes a hardship on the utility due to a narrow distance between the back of curb and the right-of-way or edge of sidewalk/bikepath, the utility may place their facilities within 2 feet of the back of the curb, but only upon approval from the City Engineer or his Designee.

Section 4.07 INSPECTION

The City Engineer or his Designee shall inspect work within the scope of this Manual to ensure that the rights-of-way are established and/or restored properly. Upon project completion, a final inspection shall be required. The City's representatives, together with the representatives of other interested agencies, shall perform the final inspection. Provide 48 hour prior request, excluding weekends and holidays, for final inspection.

The job shall be inspected against the provisions of the approved plans and the City Engineer shall not recommend acceptance until all such provisions are met, and any required tests are performed and accepted.

The Contractor shall have all materials within the scope of this Manual and the right-of-way regulations inspected before being laid, concealed or covered.

The Contractor shall inform the City Engineer or his Designee at the time backfill or any other process which should be monitored is occurring, and provide any requested reports. The laying and simultaneous covering of power cables, telephone cables, television cables, and gas mains is allowed outside the pavement.

Section 4.08 OPERATIONAL SAFETY

The City Engineer may disapprove any curb cut, median opening, or access which will constitute a public hazard or create excessive conflicts in traffic or pedestrian flow, or adversely impact the public safety.

The City Engineer or his Designee shall authorize a "stop work" order upon any Permittee who is committing or creating unsafe acts which may create a public hazard, or who is not complying with the provisions of the permit and this ARTICLE. The order shall remain in effect until such time as these matters are corrected.

The City Engineer or his Designee shall not be held responsible for any damages as a result of the above actions taken under this ARTICLE.

Any Owner/Developer of property on which there is a roadway access point lawfully in existence, but which is determined by the City to present a hazard to the public safety and welfare due to the location of curb cuts, median openings, or other matters regulated within this Manual, and which does not comply with this Manual and/or the LDC shall be required to reconstruct or alter such hazardous situation at the time of any modifications/permits (use-changes , remodeling, reconstruction, enlargement, alterations, paving).

Any curb cut made after the date of this publication, which fails to provide for smooth flow of traffic on and/or off the right-of-way and traveled way, shall be closed by the City until repaired. The City Engineer or his Designee shall make such closure upon notification to the property Owner/Developer. The closure shall be maintained until the condition has been corrected to the satisfaction of the City Engineer.

ARTICLE 5

SITE PREPARATION, SURFACE REMOVAL AND RESTORATION

Index	5.01	<u>GENERAL DEVELOPMENT STANDARDS</u>
	5.02	<u>CLEARING AND GRUBBING</u>
	5.03	<u>EROSION CONTROL</u>
	5.04	<u>DUST CONTROL</u>
	5.05	<u>SURFACE REMOVAL</u>
	5.06	<u>RESTORATION</u>
	5.07	<u>FINISHED FLOOR ELEVATIONS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	5.01	<u>GENERAL DEVELOPMENT STANDARDS</u>
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5.01.1 General

All land proposed for development within the City of Ocoee shall be suitable for the use proposed, shall be adequately served by public facilities and services, and shall conform to adopted goals, objectives, and policies of the City Commission. All proposed development shall also be consistent with the adopted Comprehensive Plan for the City.

5.01.2 Environmental Considerations

Development shall make advantageous use of natural topography and preserve mature trees wherever possible. Special development stipulations may be placed on areas with low and very low potential soils, areas within the 100 year flood plain, wetlands, and other unique environments. Because most environmental problems are site specific, conditions and proposals will be evaluated with permit reviews.

Section	5.02	<u>CLEARING AND GRUBBING</u>
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Clearing and grubbing of property shall conform to ARTICLE 7 of this Manual.

Section	5.03	<u>EROSION CONTROL</u>
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All commercial and residential Developers and Builders shall follow erosion control methods as described in Section 3.09 of this Manual. Erosion Control measures shall comply with the City of Ocoee criteria described in Section 3.09, FDOT Design Standards, and FDEP Stormwater, Erosion and Sediment Control Program and Manual

Section 5.04 DUST CONTROL

Contractor shall control dust resulting from clearing and grubbing operations to prevent nuisance to adjacent property Owners and the general public.

Section 5.05 SURFACE REMOVAL

Along the proposed pipe lines, as indicated on the plans, the Contractor shall remove the surface materials only to such widths as will permit a trench to be excavated, affording sufficient room for proper efficiency and construction. All applicable City regulations shall be followed under the guides of this Manual and FDOT Standards. Where sidewalks, driveways, pavements and curb and gutter are encountered, caution shall be taken to protect against fracture or disturbance beyond reasonable working limits. All fractured, broken or disturbed surfaces shall be restored to their original condition prior to completion of the work.

Section 5.06 RESTORATION

Restoration of all surfaces including road subbase, soil cement, limerock base, asphaltic concrete surface, Portland cement concrete pavement, driveways, sidewalks and concrete curbs shall be in strict accordance with this Manual. All grassing, sodding and mulching shall be done as specified in ARTICLE 21 of this Manual. In addition, Contractor shall restore all storm drains, culverts, inlets and storm manholes to equal or better condition in accordance with this Manual.

Section 5.07 FINISHED FLOOR ELEVATIONS

Lots and building sites shall be graded to permit construction utilizing a first floor elevation based on the following:

- A) At least 2 feet above the 100 year flood plain elevation.
- B) If a lot or site is reasonably level, or slopes toward a street, the minimum finished floor elevation shall not be less than 18 inches above the highest crown of that portion of the adjacent street, or right-of-way upon which the structure fronts. This applies to grading classified as Type A or B.
- C) If a lot or site slopes away from a street or road with continuous slope to the rear, the finished floor elevation of any structure shall be at least 1 foot above the finished elevations at the side lot lines nearest the front corners of the dwelling. This requirement applies to grading classified as Type C.
- D) In addition to the conditions of paragraphs A, B, and C above, the finished floor elevation shall be a minimum of 6 inches above the rim elevation of the nearest downstream gravity sewer manhole serving the lot.

- E) It is the intent of the City that lots and building sites provide the necessary finished floor elevation without excessive filling of land. Specific grading plans with proposed finished floor elevations and grading shall be submitted for review and approval of the Public Works Department. When a subdivision lot grading plan has been prepared and approved, specified finished floor elevations and grading types shall be observed. Finished floor elevation shall not deviate below that specified in the grading plan, but may be increased up to 6 inches above that specified without approval. Justification shall be provided for raising finished floor elevation more than 6 inches above that specified. An approved plan that specifies individual elevations shall supersede the requirements of (B) and (C) above and this paragraph.
- F) Swales shall be constructed to carry runoff along side lot lines without allowing unintended runoff to adjacent lots. Grading shall minimize the impact of runoff onto other lots when intended by Type B and C grading. Use of stem wall construction, retaining walls or other techniques shall be considered to improve drainage and aesthetics. Areas adjacent to structures or paved surfaces shall be graded to drain away from structures and pavement. Ponding shall be prevented.
- G) All slopes of 4:1 or greater shall be sodded. Sodded slopes shall not exceed 4:1 without approval. Where lots adjoin ponds, natural, conservation, or common areas, the lot line elevation specified on the subdivision plans (or natural elevation) shall be maintained and the lot graded at a slope not to exceed 4:1.

ARTICLE 6

EXCAVATION, TRENCHING, AND BACKFILLING

Index	6.01	<u>GENERAL</u>
	6.02	<u>SOIL BORINGS AND SUBSURFACE INVESTIGATIONS</u>
	6.03	<u>EXISTING UTILITIES</u>
	6.04	<u>MATERIALS</u>
	6.05	<u>SHEETING AND BRACING IN EXCAVATIONS</u>
	6.06	<u>DEWATERING, DRAINAGE AND FLOTATION</u>
	6.07	<u>EXCAVATION</u>
	6.08	<u>BEDDING AND BACKFILL</u>
	6.09	<u>COMPACTION</u>
	6.10	<u>GRADING</u>
	6.11	<u>MAINTENANCE</u>
	6.12	<u>INSPECTION AND QUALITY ASSURANCE</u>

[BACK TO TABLE OF CONTENTS](#)

Section	6.01	<u>GENERAL</u>
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This ARTICLE covers excavation, backfill, fill and grading associated with utility trench and structural construction. The Contractor shall furnish all labor, materials, equipment and incidentals necessary to perform all excavation, backfill, fill, compaction, grading and slope protection required to complete the work shown on the Drawings and specified herein. The work shall include, but not necessarily be limited to: pump stations, manholes, vaults, conduits, pipes, roadways and paving; all backfilling, fill and required borrow; grading; disposal of surplus and unsuitable materials; and all related work such as sheeting, bracing and water handling.

Section	6.02	<u>SOIL BORINGS AND SUBSURFACE INVESTIGATIONS</u>
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The Contractor shall examine the site and undertake subsurface investigations, including soil borings, before commencing the work. The City will not be responsible for presumed or existing soil conditions in the work area.

Section	6.03	<u>EXISTING UTILITIES</u>
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The Contractor shall locate existing utilities in the areas of work prior to starting construction activities. If utilities are to remain in place, the Contractor shall provide adequate means of protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, the Contractor shall consult the Owner of such piping or utility immediately for directions. Payment for damage and repair to such piping or utilities is the Contractor's responsibility.

The City shall not be responsible for uncharted or incorrectly charted water and wastewater mains or other utilities. It is the Contractor's responsibility to ensure that such facilities exist at the presumed point prior to commencing construction.

Section 6.04 MATERIALS

6.04.01 General

Materials for use as bedding and backfill shall be as described under this Section. The Contractor shall, upon request by the City, make an appropriate sample of this material available for testing by the City or its designated representative.

6.04.02 Structural Fill

Materials for structural fill shall be bedding rock or select common fill as specified herein or other suitable material as approved by the City.

6.04.03 Common Fill

Common fill shall consist of mineral soil, substantially free of clay, organic material, loam, wood, trash and other objectionable material which may be compressible or which cannot be compacted properly. Common fill shall not contain stones larger than 6 inches in any dimension, asphalt, broken concrete, masonry, rubble, or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Additionally, common fill shall be no more than 12% by weight finer than the No. 200 mesh sieve unless finer material is approved for use in a specific location by the City.

Material falling within the above Specifications, encountered during the excavation, may be stored in segregated stockpiles for reuse. All material which in the opinion of the City is not suitable for reuse, shall be spoiled as specified herein for disposal of unsuitable materials.

6.04.04 Select Common Fill

Select common fill shall be as specified above from common fill, except that the material shall contain no stones larger than 1½ inches in largest dimension, and shall be no more than 5% by weight finer than the No. 200 mesh sieve.

6.04.05 Bedding Rock

Bedding rock shall be ¾ inch to 1½ inch washed and graded stone (FDOT #57). This stone shall be graded so that 90% to 100% will pass a ¾ inch screen and 95% to 100% will be retained on a No. 8 screen. No stones larger than 1 inch in any dimension shall be accepted.

Table 6-1				
	<u>Type of Fill</u>	<u>Usage</u>	<u>Final Compacted</u>	<u>%</u>
1)	Trenched Pipe Foundation, Bedding, and Haunching	Beneath piping	6"	98
2)	Trenched Pipe Cover	Over and/or around piping	6"	98
3)	Utilities Trench Backfill	"Influence area" beneath other piping or utility lines	8"	98
		"Influence area" beneath rigid paving and railroad tracks	6"	98
		"Influence area" beneath non-rigid paving	9"	98
		Adjacent to or under structures	9"	98
4)	Structural Fill	All locations under minor structures (manhole, etc.)	8"	98
5)	Granular Fill	Below concrete slabbedding, foundations, rigid paving, and excavated areas adjacent to structures	8"	98
6)	Structural Backfill	(See Trench Backfill)		
7)	General Site Grading	Fill in other locations not covered herein	12"	92
		Topsoil Placement	12"	92

"Influence area" shall be considered the area within lines sloped downward at 45° from the outer edges of paving, foundations, and utility lines.

Section 6.05 SHEETING AND BRACING IN EXCAVATIONS

6.05.01 General

If required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction and to protect adjacent structures, existing piping and/or foundation material from disturbance, undermining or other damage, the CONTRACTOR shall construct and maintain sheeting and bracing. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

6.05.02 Miscellaneous Requirements

For trench sheeting for pipes, no sheeting is to be withdrawn if driven below mid-diameter of any pipe and no wood sheeting shall be cut off at a level lower than one foot above the top of any pipe unless otherwise directed by the TWA. If, during the progress of the WORK, the TWA decides that additional wood sheeting should be left in place, it may direct the CONTRACTOR to do so. If steel sheeting is used for trench sheeting, removal shall be as specified above, unless written approval is given by the TWA for an alternate method of removal. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities, existing piping or property. Unless otherwise approved or indicated on the Drawings or in the Specifications, all sheeting and bracing shall be removed after completion of the substructure. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools specially adapted to that purpose, by watering or otherwise as may be directed.

The right of the TWA to order sheeting and bracing left in place shall not be construed as creating an obligation on its part to issue such orders, and its failure to exercise its right to do so shall not relieve the CONTRACTOR from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the CONTRACTOR to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

The CONTRACTOR shall construct the sheeting outside the neat lines of the foundation unless indicated otherwise to the extent he deems it desirable for his method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting, bracing and cofferdams shall be adequate to withstand all pressures to which the structure will be subjected. Pumping, bracing and other work within the cofferdam shall be done in a manner to avoid disturbing any construction already performed. Any movement or bulging, which may occur, shall be corrected by the CONTRACTOR at his own expense so as to provide the necessary clearances and dimensions.

Section

6.06

DEWATERING, DRAINAGE AND FLOTATION

6.06.01

General

The Contractor shall excavate, construct and place all pipelines, concrete work, fill, and bedding rock, in-the-dry. In addition, the Contractor shall not make the final 24 inches of excavation until the water level is a minimum of 1 foot below proposed bottom of excavation. For purposes of these Specifications, “in-the-dry” is defined to be within 2% of the optimum moisture content of the soil. The City reserves the right to ask the Contractor to demonstrate that the water level is a minimum of 1 foot below proposed bottom of excavation before allowing the construction to proceed.

Discharge water shall be clear with no visible soil particles and must be in compliance with all Regulatory Agency Requirements. Discharge from dewatering shall be disposed of in such a manner that it will not interfere with the normal drainage of the area in which the work is being performed, create a public nuisance, or form ponding. The operations shall not cause injury to any portion of the work completed, or in progress, or to the surface of streets, or to private property. The dewatering operation shall comply with the requirements of appropriate regulatory agencies. Additionally, where private property will be involved, advance permission shall be obtained by the Contractor. All dewatering activities shall comply with the current standards of SJRWMD and FDEP.

6.06.02

Additional Requirements

The Contractor shall, at all times during construction, provide and maintain proper equipment and facilities to remove promptly and dispose of properly all water entering excavations, and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fill, structure, or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.

Dewatering shall at all times be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

It is expected that well points or other engineered dewatering systems will be required for pre-drainage of the soils prior to final excavation for some of the deeper in-ground structures, or piping and for maintaining the lowered groundwater level until construction has been completed to such an extent that the structure, pipeline or fill will not be floated or otherwise damaged. Well points shall be surrounded by suitable filter sand and negligible fines shall be removed by pumping.

The Contractor shall furnish all materials and equipment and perform all work required to install and maintain the drainage systems for handling groundwater and surface water encountered during construction of structures, pipelines and compacted fills.

During backfilling and construction, water levels shall be measured in observation wells located as directed by the City.

Continuous pumping shall be required as long as water levels are required to be below natural levels.

Section 6.07 EXCAVATION

6.07.01 General

Excavation consists of removal, storage and disposal of material encountered when establishing required grade elevations and in accordance with the notes shown in the Contract Documents. Authorized earth excavation includes removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, and other materials encountered that are not classified as rock excavation or unauthorized excavation. Unauthorized excavation consists of removal of material beyond the limits needed to establish required grade and subgrade elevations without specific direction of the City. Unauthorized excavation, as well as remedial work directed by the City, shall be at the Contractor's expense. Such remedial work shall be performed as directed by the City.

If requested by the City, when excavation has reached required subgrade elevations, a Geotechnical/Soils Engineer shall make an inspection of conditions. If the subgrade is unsuitable, Contractor shall carry excavation deeper and replace excavated material with select common fill or bedding rock, as directed by the City.

If the Contractor excavates below grade through error, for convenience, or through failure to properly dewater the excavation or disturbs the subgrade before dewatering is sufficiently complete, the Contractor may be directed by the City to excavate below grade and refill the excavation using select common fill or bedding rock.

Slope sides of excavations shall comply with Local Codes and Ordinances, and with OSHA requirements. Contractor shall shore and brace where sloping is not possible due to space restrictions or stability of the material excavated. Sides and slopes shall be maintained in a safe condition until completion of backfilling.

Contractor shall stockpile satisfactory excavated materials at a location approved by the City until required for backfill or fill. When needed in the work, material shall be located and graded at the direction of a Geotechnical/Soils Engineer. Stockpiles shall be placed and graded for proper drainage. All soil materials shall be located away from the edge of excavations. All surplus and/or unsuitable excavated material shall be legally disposed of by the Contractor. Any permits required for the hauling and disposing of this material shall be obtained by the Contractor prior to commencing hauling operations.

6.07.02 Excavation For Structures

All such excavations shall conform to the elevations and dimensions shown in the Contract Documents within a tolerance of plus or minus 0.10 foot and extending a sufficient distance from footings and foundations to permit placing and removing form work, installation of services and other construction, inspection or as shown in the Contract Documents . In excavating for footings and foundations, care shall be exercised not to disturb the bottom of the excavation. Bottoms shall be trimmed to required lines and grades to leave a solid base to receive concrete.

6.07.03 Trench Excavation

Excavation for all trenches required for the installation of utility pipes shall be made to the depths indicated in the Contract Documents and in such manner and to such widths as will give suitable room for laying the pipe within the trenches, for bracing and supporting, and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the City.

Excavation shall not exceed normal trench width as specified in the Typical City Details attached as part of this Manual. Any excavation which exceeds the normal trench width shall require special backfill requirements as determined by the City.

Where pipes are to be laid in bedding rock, select common fill or encased in concrete, the trench may be excavated by machinery to or just below the designated subgrade, provided that the material remaining in the bottom of the trench is no more than slightly disturbed.

Where the pipes are to be laid directly on the trench bottom, the lower part of the trenches shall not be excavated to grade by machinery. The last of the material being excavated shall be done manually in such a manner that will give a shaped bottom, true to grade, so that pipe can be evenly supported on undisturbed material, as specified in the Typical City Details attached as part of this Manual. Bell holes shall be made as required.

Section 6.08 BEDDING AND BACKFILL

6.08.01 General

Material placed in fill areas under and around structures and pipelines shall be deposited within the lines and to the grades shown on the Drawings or as directed by the City, making due allowance for settlement of the material. Fill shall be placed only on properly prepared surfaces which have been inspected and approved by the City. If sufficient select common or common fill material is not available from excavation on-site, the Contractor shall provide fill as may be required.

Fill shall be brought up in substantially level lifts starting in the deepest portion of the fill. The entire surface of the work shall be maintained free from ruts and in such condition that construction equipment can readily travel over any section. Fill shall be placed and spread in layers by a backhoe or other approved method, unless otherwise specified. The Contractor shall assign a sufficient number of men to this work to insure satisfactory compliance with these requirements.

All fill materials shall be placed and compacted “in-the-dry”. The Contractor shall dewater excavated areas as required to perform the work and in such manner as to preserve the undisturbed state of the natural inorganic soils.

Prior to filling, the ground surface shall be prepared by removing vegetation, debris, unsatisfactory soil materials, obstructions and deleterious materials. Contractor shall plow strip or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with the existing surface. When existing ground surface has a density less than that specified for the particular area classification, Contractor shall break up the ground surface, pulverize, moisture-condition to the optimum moisture content and compact to required depth and percentage of maximum density.

Before compaction, material shall be moistened or aerated as necessary to provide the optimum moisture content. Material which is too wet shall be spread on the fill area and permitted to dry, assisted by harrowing if necessary, until the moisture content is reduced to allowable limits. If added moisture is required, water shall be applied by sprinkler tanks or other sprinkler systems, which will insure uniform distribution of the water over the area to be treated and give complete and accurate control of the amount of water to be used. If too much water is added, the area shall be permitted to dry before compaction is continued. The Contractor shall supply all hose, piping, valves, sprinklers, pumps, sprinkler tanks, hauling equipment and all other materials and equipment necessary to place water in the fill in the manner specified. Contractor shall compact each layer to required percentage of maximum dry density or relative dry density in accordance with this Manual. Backfill or fill material shall not be placed on surfaces that are muddy, frozen or contain frost or ice. Contractor to Supply all materials and equipment necessary for proper installation.

6.08.02 Bedding and Backfill For Structures

Bedding rock shall be used for bedding under all structures as specified in the Latest Typical City Details. The Contractor shall take all precautions necessary to maintain the bedding in a compacted state and to prevent washing, erosion or loosening of this bed. Structural fill shall be used as backfill against the exterior walls of the structures. Fill shall be compacted sufficiently in accordance with these Specifications. If compaction is by rolling or ramming, material shall be wet down as required.

Backfilling shall be carried up evenly on all walls of an individual structure. No backfill shall be allowed against walls until the walls and their supporting slabs, if applicable, have attained sufficient strength.

In locations where pipes pass through building walls, the Contractor shall take precautions to consolidate the fill up to an elevation of at least 1 foot above the bottom of the pipes. Structural fill in such areas shall be placed for a distance of not less than 3 feet either side of the center line of the pipe in level layers not exceeding 8 inches in depth.

The surface of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated on the Drawings. No soft spots or uncompacted areas shall be allowed in the work.

Temporary bracing shall be provided as required during construction of all structures to protect partially completed structures against all construction loads, hydraulic pressure and earth pressure. The bracing shall be capable of resisting all loads applied to the walls as a result of backfilling.

6.08.03 Bedding and Backfill For Pipes

Bedding for pipe shall be as shown on the plans and as specified in the Typical City Details attached as part of this Manual. The Contractor shall take all precautions necessary to maintain the bedding in a compacted state and to prevent washing, erosion or loosening of this bed.

Backfilling over and around pipes shall begin as soon as practical after the pipe has been laid, jointed and inspected as specified in the Typical City Details attached as part of this Manual.

Any space remaining between the pipe and sides of the trench shall be carefully backfilled and spread by hand or approved mechanical device and thoroughly compacted with a tamper as fast as placed, up to a level of 1 foot above the top of the pipe. The filling shall be carried up evenly on both sides. Compaction shall be in accordance with this Manual.

The remainder of the trench above the compacted backfill, as just described above, shall be filled and thoroughly compacted in uniform layers. Compaction shall be in accordance with this Manual.

Section 6.09 COMPACTION

6.09.01 General

The Contractor shall control soil compaction during construction to provide the percentage of maximum density specified. The Contractor shall provide the City copies of all soils testing reports, prepared by a Geotechnical/Soils Engineer, demonstrating compliance with these Specifications.

When an existing trench bottom has a density less than that specified under these Specifications, the Contractor shall break up the trench bottom surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

6.09.02 Percentage of Maximum Density Requirements

The CONTRACTOR shall control soil compaction during construction to provide the percentage of maximum density specified. When utility work is conducted within FDOT right-of-way or other governing municipality, the more stringent minimum density standards shall apply.

Fill or undisturbed soil from the bottom of the pipe trench to one foot above the pipe to the finished grade elevation shall be compacted to a minimum density of 98 percent of the maximum dry density as determined by AASHTO T-180 for all structural areas or right of way or easements with vehicular traffic on top of the pipe. Other non- structural areas may be compacted to a minimum density of 95% of maximum dry density as determined by AASHTO T-180.

6.09.03 Compaction Tests

One compaction test location shall be required for each 300 linear feet of pipe and for every 100 square feet of backfill around structures as a minimum. The City may determine that more compaction tests are required to certify the installation depending on field conditions. The locations of compaction tests within the trench shall be in conformance with the following schedule:

- A) One test at the spring line of the pipe.
- B) At least one test for each 12 inch layer of backfill within the pipe bedding zone for pipes 24 inches and larger.
- C) One test at an elevation of 1 foot above the top of the pipe.
- D) One test for each 2 feet of backfill placed from 1 foot above the top of the pipe to finished grade elevation.

If, based on the Geotechnical/Soils Engineer testing reports and inspection, fill which has been placed is below specified density, Contractor shall provide additional compaction and testing prior to commencing further construction.

Section 6.10 GRADING

All areas within the limits of construction, including transition areas, shall be uniformly graded to produce a smooth, uniform surface. Areas adjacent to structures or paved surfaces shall be graded to drain away from structures and pavement. Ponding shall be prevented. After grading, the area shall be compacted to the specified depth and percentage of maximum density.

No grading shall be done in areas where there are existing pipelines that may be uncovered or damaged until such lines have been relocated.

Section 6.11 MAINTENANCE

Contractor shall protect newly graded areas from traffic and erosion and keep them free of trash and debris. Contractor shall repair and reestablish grades in settled, eroded and rutted areas.

Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, Contractor shall scarify surface and reshape and compact to required density prior to further construction.

Section 6.12 INSPECTION AND QUALITY ASSURANCE

6.12.01 Inspection

Contractor shall examine the areas and conditions under which excavating, filling and grading are to be performed, and not proceed with the work until unsatisfactory conditions have been corrected.

Contractor shall examine existing grade prior to commencement of work and report to the City if elevations of existing grade vary from elevations shown on Drawings.

6.12.02 Quality Assurance

All work shall be performed in compliance with applicable requirements of governing authorities having jurisdiction.

The City shall provide quality control testing during construction to ensure compliance with these Specifications.

Contractor shall allow the testing service to inspect and approve fill materials and fill layers before further construction is performed. The Contractor shall be given copies of all test results. Contractor shall be financially responsible for all failed and/or substandard material testing.

ARTICLE 7

CLEARING AND GRUBBING

Index	7.01	<u>GENERAL</u>
	7.02	<u>CLEARING AND GRUBBING</u>
	7.03	<u>DISPOSAL OF UNSUITABLE MATERIALS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	7.01	<u>GENERAL</u>
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The work covered by this ARTICLE consists of clearing and grubbing and the proper removal and disposal of the resultant products and debris within the areas of the rights-of-way, easements, retention areas, and all other construction areas. Dust control is mandatory. All appropriate permits shall be obtained prior to start of activity. Existing trees and other vegetation that are designated to remain shall be protected in accordance with the LDC.

Section	7.02	<u>CLEARING AND GRUBBING</u>
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Clearing and grubbing shall consist of the removal and proper disposal of all timber, brush, stumps, roots, grass, weeds, sawdust, rubbish, buildings, septic tanks, pipe, foundations, and all other deleterious material resting on or protruding through the surface of the excavated areas. All wells with no future use shall be abandoned in accordance with Florida Department of Environmental Protection and local Water Management District regulations.

In all areas of roadway construction and embankment, trees, stumps, roots, and other deleterious materials shall be removed to a depth of not less than 2 feet below the subgrade.

Section	7.03	<u>DISPOSAL OF UNSUITABLE MATERIALS</u>
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Unsuitable material shall be the property of the Owner/Developer, and materials shall be disposed of in accordance with current City, County, State, and Federal Regulations.

ARTICLE 8

EARTHWORK

Index	8.01	<u>GENERAL</u>
	8.02	<u>EXCAVATION</u>
	8.03	<u>UNSUITABLE MATERIAL</u>
	8.04	<u>SUITABLE MATERIAL</u>
	8.05	<u>DISPOSAL OF EXCESS MATERIAL</u>
	8.06	<u>PLACING EMBANKMENT</u>
	8.07	<u>SHOULDERS, DITCHES, AND SLOPES</u>

[BACK TO TABLE OF CONTENTS](#)

Section	8.01	<u>GENERAL</u>
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The work covered by this ARTICLE consists of excavation and embankment required for roadway, ditches, channel changes and other works.

Unless otherwise provided, this ARTICLE shall include all excavation, shaping, filling, sloping and finishing necessary for the construction, preparation, and completion of all embankments, subgrades, shoulders, ditches, slopes, gutters, intersections, approaches, private entrances, and other works all in accordance with the required alignment, grade, and cross sections shown on the plans or as directed, by the City Engineer or his Designee. All earthwork within the City of Ocoee will comply with FDOT Standard Specifications for Road and Bridge Construction, most current edition.

Section	8.02	<u>EXCAVATION</u>
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While the excavation is being done and until the work is finally accepted, the Contractor shall take the necessary steps to protect the work to prevent loss of material from the construction area due to the action of wind or water. During construction, the area shall be maintained in such condition that it will not constitute a hazard and shall be well drained at all times.

Section	8.03	<u>UNSUITABLE MATERIAL</u>
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Where muck, rock, clay, organic, or other materials within the limits of the construction area is, in the opinion of the City Engineer, unsuitable, the Contractor shall excavate to a depth approved by the City Engineer or his Designee and then backfill with suitable material in an approved manner, shaping to conform to the required cross section.

Section	8.04	<u>SUITABLE MATERIAL</u>
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Suitable material excavated from existing City right-of-way shall be hauled to a designated location within the City. Location to be designated by City Engineer

Section 8.05 DISPOSAL OF EXCESS MATERIAL

Excess material shall be disposed of in accordance with current City, County, State of Florida, and Federal regulations.

Section 8.06 PLACING EMBANKMENT

Embankments shall be constructed of suitable materials placed in successive level layers not more than 12 inches in thickness, loosely measured, for the full width and the full length of the embankment, and compacted to a minimum density of 98% of the maximum density value as determined by AASHTO T-180.

Section 8.07 SHOULDERS, DITCHES, AND SLOPES

When the work includes surfacing or paving, the earthwork, including the slopes and all drainage structures, shall be Substantially Completed before the construction of the base course and pavement is started.

During the construction of the pavement, a shoulder at least 3 feet wide shall be maintained in place to properly support the edges of the pavement or curb. Before final acceptance by the City, the earth shoulders, slopes, and side ditches shall be completed and shaped to a surface which is within 0.1 foot above or below the true surface shown on the plans; except that, adjacent to pavement, curb, or sidewalk/bikepath, the shoulders shall be shaped to match the edge of the pavement, curb or sidewalk/bikepath. The shoulder line shall not vary more than 0.3 foot horizontally from the true lines shown on the plans.

All earth work within 5 feet of the roadway must be compacted to a minimum density of 98% of the maximum dry density as determined by AASHTO T-180.

ARTICLE 9

SUBBASE

Index	9.01	<u>DESCRIPTION</u>
	9.02	<u>SUBBASE REQUIREMENTS</u>
	9.03	<u>STABILIZATION</u>
	9.04	<u>CONSTRUCTION</u>
	9.05	<u>TESTING</u>

[BACK TO TABLE OF CONTENTS](#)

Section	9.01	<u>DESCRIPTION</u>
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Subbase shall be defined as that portion of the roadbed immediately below the base course or pavement including below the curb and gutter, the limits of which will ordinarily include those portions of the roadbed shown in the plans. The limits of the subbase shall be considered to extend outward to 12 inches beyond the base. On roadways where curbs are utilized, the subbase shall extend to 12 inches beyond the back of curb.

All subbase material installed within the City of Ocoee will comply with the FDOT Standard Specifications for the Road and Bridge Construction, most current edition.

Section	9.02	<u>SUBBASE REQUIREMENTS</u>
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Before the following items are constructed, subbase material is required as specified:

- A) Stabilize top 12 inches to Limerock Bearing Ratio (LBR) 40.
- B) Compact to a minimum density of 98% of the maximum density determined by AASHTO T-180 for top 12 inches.

Section	9.03	<u>STABILIZATION</u>
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The stabilizing material shall be high bearing value soil, sand-clay, limerock, shell, or other material approved by the City Engineer and shall meet the physical requirements of FDOT.

Section	9.04	<u>CONSTRUCTION</u>
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The surface of the subbase shall conform to the lines and grades as defined on the construction plans to a tolerance of 0.05 foot. If surface exhibits plastic deformations during compaction, the existing wet material shall be removed and replaced by dry material. The method of aeration may be used if permitted by the City Engineer.

Section	9.05	<u>TESTING</u>
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Refer to ARTICLE 15 of this Manual for testing and quality control requirements.

ARTICLE 10

SOIL CEMENT BASE

Index	10.01	<u>DESCRIPTION</u>
	10.02	<u>USE OF SOIL CEMENT APPROVAL</u>
	10.03	<u>DESIGN MIX</u>
	10.04	<u>MATERIALS</u>
	10.05	<u>EQUIPMENT</u>
	10.06	<u>CONSTRUCTION METHODS</u>
	10.07	<u>OPENING TO TRAFFIC</u>
	10.08	<u>MAINTENANCE</u>
	10.09	<u>INSPECTION</u>

[BACK TO TABLE OF CONTENTS](#)

Section	10.01	<u>DESCRIPTION</u>
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The work specified in this ARTICLE shall consist of the construction of a soil cement base course composed of soil and Portland cement uniformly mixed, moistened, compacted, finished and cured in accordance with these Specifications, and shall conform to the lines, grades thicknesses and typical cross sections shown on the plans.

The base shall be designed to have a minimum in-situ strength of 350 psi. Seven day laboratory design compressive-strength shall be a minimum of 500 psi for mixed in-place and 450 psi for plant mixed.

Section	10.02	<u>USE OF SOIL CEMENT APPROVAL</u>
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The use of soil cement is generally not permissible and shall not be used without the City Engineer's permission. The City Engineer shall only consider the use of soil cement under conditions when normal base material functions may fail due to field conditions. Additional information supporting the request for and the use of soil cement may be required.

Section	10.03	<u>DESIGN MIX</u>
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	10.03.01	<u>Minimum Requirements</u>
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Processing of the base shall not be started until the soil cement design mix, which has been prepared by a registered Geotechnical/Soils Engineer, for the particular soil has been submitted to and approved by the City Engineer or his Designee. The following shall be the minimum items included with the mix design submittal:

- A) Cement content.
- B) Optimum moisture content.

- C) Minimum and maximum moisture content.
- D) Seven laboratory compressive strength.
- E) Anticipated 7 day field compressive strength.
- F) Method of application and timing (including total time from batching to completion).
- G) Other information as requested.

10.03.02 Notification

Construction of the soil cement base shall not proceed without 72 hour notice to the Engineering Inspection Division of the City of Ocoee.

Section 10.04 MATERIALS

10.04.01 Portland Cement

Portland Cement shall be Type I or Type I-P and shall comply with the Standard Specifications for Portland Cement ASTM C-145. Cement which is partially set, lumpy or caked shall not be used. One cubic foot of Portland Cement shall be considered to weigh 94 lbs.

10.04.02 Water

Water shall be clean and free from substance deleterious to the hardening of the soil cement.

10.04.03 Soil

Only soils which have proven themselves to produce a high quality soil cement base shall be acceptable. New sources of soil cement material must be approved by the City Engineer prior to use.

10.04.04 Soil Cement Mix Types

Central mixed plant materials:

- A) Only a central mixed material from an approved commercial source shall be acceptable for use as a base material for improvements to be dedicated to the City of Ocoee.
- B) In place mixed materials shall only be an option for an Owner/Developer on private property or for improvements not being dedicated to the City. The Owner/Developer shall provide to the City a certification from the Geotechnical or Project Engineer stating that the results of all testing of the mixed in place materials are satisfactory.

Section 10.05 EQUIPMENT

Soil cement may be constructed with any machine, combination of machines or equipment that will produce the results meeting the requirements for soil pulverization, cement application, mixing, uniform depth control, water application, incorporation of materials, compaction, finishing and curing, as required by these Specifications.

Section 10.06 CONSTRUCTION METHODS

10.06.01 Responsibility

The Contractor is responsible for completing the project in accordance with plans and Specifications and with experienced competent supervision.

10.06.02 Preparation

Before construction operations are begun, the area to be paved shall be graded and shaped as required to construct the soil cement base in conformance with the grades, lines, thicknesses and typical cross section shown on the plans. Additional soil needed, if any, shall be placed as directed. Unsuitable and/or yielding soil or material shall be removed and replaced with acceptable soil.

10.06.03 Delivery of Materials

All soil cement deliveries shall be accompanied by a batch time stamped on the delivery ticket by means of a mechanical time clock. Batch time shall be an accurate time of concrete batch and delivery truck departure from the batch plant.

10.06.04 Application of Water and Moist Mixing

Immediately after and/or during the mixing of soil and cement, and before beginning the compaction, the moisture content of the soil cement mixture shall be determined by the laboratory and, if required, water shall be applied uniformly in quantities required to obtain proper moisture content. After the final application of water, mixing shall be continued until the water is distributed uniformly through the full depth of the mixture.

When water application and mixing has been completed, the percentage of moisture in the mixture and in unpulverized soil lumps, based on oven-dry weights, shall not be more than 2 percentage points above the specified optimum moisture content, and shall not be less than that quantity which will cause the soil cement mixture to become unstable during compaction and finishing.

10.06.05 Compaction

Prior to beginning of compaction, the mixture shall be in a loose condition for its full depth. The loose mixture shall then be uniformly compacted until the entire depth of the mixture is compacted to a minimum density of 98% of the maximum density in accordance with AASHTO T-180 as determined in the field on representative samples of soil cement mixture obtained from the roadway at the time compaction begins. During the compaction operations, shaping may be required to obtain the required grades and cross section. The maximum time allowed between the last moist mixing and compaction shall be 60 minutes.

10.06.06 Finishing

After the mixture has been initially compacted, the surface of the soil cement shall be shaped to the required lines, grades and cross section. During the shaping operations, the surface shall be lightly scarified to loosen any imprints left by the compacting or shaping equipment, when deemed necessary. The resulting surface shall then be compacted to the specified density with a pneumatic tire roller. Rolling shall be supplemented by broom-dragging, if required.

The moisture content of the surface material must be maintained at not less than its specified optimum moisture content during finishing operations. Surface compaction and finishing shall be done in such a manner as to produce a smooth, dense surface, free of surface compaction planes, cracks, ridges or loose material. Surface-finishing methods may be varied, provided a smooth, dense surface, free of surface compaction planes is produced. The moisture and density requirements shall be determined by the methods prescribed in AASHTO T-135.

10.06.07 Surface Requirements (Scalping or Hard-Planing)

After compaction and finishing have been completed, and not later than the beginning of the next calendar day after the construction of any section of the base, the surface shall be tested with a template cut to the required crown and/or with a 15 foot straight edge laid parallel to the centerline. All irregularities greater than ¼ inch shall be immediately corrected with a blade adjusted to the lightest cut, which will insure a surface that does not contain depressions greater than ¼ inch under the template or the straight-edge. The material removed shall be wasted. Additional wetting during and after this final shaping operation shall be required to keep the base continuously moist.

10.06.08 Prime/Curing

The curing material shall be applied immediately after the completion of finishing operations. The finished soil cement shall be kept continuously wet until the curing material is placed. After the soil cement has been finished as specified herein, it shall be protected against drying for 7 days by the application of bituminous coating.

Prime and curing materials shall conform to ARTICLE 12 of this Manual. Covering the application of bituminous materials, including but not limited to: materials, equipment, cleaning of the base, weather limitations, application of prime coat and application of tack coat.

10.06.09 Construction Joints

Prior to the beginning of each day's construction, a straight transverse construction joint shall be formed by cutting back into the completed work to form a true vertical face.

10.06.10 Thickness

During various stages of construction, test holes or trenches shall be dug in the mixture to determine the thickness. After the base is completed test holes shall be dug or cored at intervals of not more than 300 feet, or at closer intervals if necessary, and the thickness of the base shall be determined from measurements made in these test holes.

Where the base is deficient in thickness by more than ½ inch, the area of deficient base shall be removed and replaced by base of the required thickness, at the Contractor's expense. Except, at the City Engineer's discretion, such deficient base thickness may be left in place if the deficiency can be made up in asphaltic surface course.

Section 10.07 OPENING TO TRAFFIC

The Contractor shall not be permitted to drive heavy equipment over the completed sections. Light weight pneumatic-tired equipment may be permitted after the surface has hardened sufficiently to prevent the equipment from marking the surface and provided the protection and curing specified are not impaired. Completed section may be opened to light traffic after 24 hours, provided the surface has hardened sufficiently to prevent marking by traffic and has been inspected by the City Engineer or his Designee. An application of sand shall only be done prior to opening to construction traffic.

Section 10.08 MAINTENANCE

The Contractor shall maintain the base to a true and satisfactory surface until the wearing surface is constructed. Should any repairs or patching be necessary, they shall extend to the full depth of the base and shall be made in a manner that will assure restoration of a uniform base course conforming to the requirements of these Specifications. The bituminous curing coating shall be maintained until the wearing surface is constructed.

Section**10.09****INSPECTION**

After a minimum of 7 days have elapsed and prior to applying the asphalt wearing surface, a detailed engineering inspection of the base shall be performed by the City Engineer or his Designee, Geotechnical/Soils Engineer, and Contractor. This inspection of the hardened soil cement base is required prior to approval for paving, to assure that the soil cement base has set-up satisfactorily and that no soft areas or surface scabs exist which may need repair. Prior to commencing paving operations, all deficiencies shall be corrected and approved by the City Engineer or his Designee.

ARTICLE 11

LIMEROCK BASE

Index	11.01	<u>GENERAL</u>
	11.02	<u>MATERIALS</u>
	11.03	<u>EQUIPMENT</u>
	11.04	<u>TRANSPORTING LIMEROCK</u>
	11.05	<u>SPREADING LIMEROCK</u>
	11.06	<u>COMPACTING AND FINISHING BASE</u>
	11.07	<u>PRIME/CURING</u>
	11.08	<u>TESTING SURFACE</u>
	11.09	<u>TESTS</u>
	11.10	<u>DEFICIENCIES</u>
	11.11	<u>OPENING TO TRAFFIC</u>
	11.12	<u>MAINTENANCE</u>

[BACK TO TABLE OF CONTENTS](#)

Section	11.01	<u>GENERAL</u>
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The work specified in this ARTICLE consists of the construction of a base course composed of limerock. It shall be constructed on the prepared subgrade in accordance with these Specifications and in conformity with the lines, grades, notes, and typical cross sections shown on the plans. Where so shown on the plans, the base shall be constructed in 2 courses. Where the plans do not specify double-course base, the base may be constructed in either 1 or 2 courses.

All limerock base installed within the City of Ocoee will comply with the FDOT Standard Specifications for the Road and Bridge Construction, most current edition.

Section	11.02	<u>MATERIALS</u>
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The material used shall be obtained from a FDOT certified mine (pit).

Section	11.03	<u>EQUIPMENT</u>
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This work may be performed with any machine, combination of machines, or equipment that will produce the specified results.

Section	11.04	<u>TRANSPORTING LIMEROCK</u>
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The limerock shall be transported to the point where it is to be used over rock previously placed and dumped on the end of the preceding spread. In no case shall rock be dumped directly on the subgrade. The Contractor may seek relief from this requirement when the subgrade is to be adequately stabilized, as approved by the City Engineer.

Section 11.05 SPREADING LIMEROCK

The limerock shall be spread uniformly. All segregated areas of fine or coarse rock shall be removed and replaced with well-graded rock.

For double-course base, the rock shall be spread in 2 courses, and the thickness of the first course shall be approximately $\frac{1}{2}$ the total thickness of the finished base, or enough additional to bear the weight of the construction equipment without disturbing the subgrade.

Section 11.06 COMPACTING AND FINISHING BASE

For double course base, the first course shall be bladed if necessary to secure a uniform surface, and shall be compacted to the density specified below, immediately prior to spreading the second course. No other finishing of this course is required.

After spreading is completed, the entire surface shall be scarified and shaped so as to produce the exact grade and cross section after compaction. For double course bases, this scarifying shall extend to a depth sufficient to penetrate slightly the surface of the first course.

Proper moisture condition shall be maintained uniformly throughout the material during the compaction operation. The material shall be compacted to a minimum density of 98% of the maximum density obtainable under AASHTO T-180. Where the base is being constructed in one course and the specified thickness is more than 6 inches, the density specified above shall be obtained in both the bottom half and top half of the base. During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density determinations on the finished base.

The surface shall be “hard-planed” with a grader immediately prior to the application of the prime coat to remove the thin-glazed or cemented surface, leaving a granular or porous condition that will allow free penetration of the prime material. The materials planed from the base shall be removed from the base area.

If, at any time, the subgrade material should become mixed with the base course material, the Contractor, at their cost shall excavate and remove the mixture, reshape and compact the subgrade, and replace the materials removed with clean base material, which shall be shaped and compacted as specified above.

Section 11.07 PRIME/CURING

Once limerock has been finished as specified herein, it shall be protected by the application of a bituminous coating. The bituminous material shall be applied as soon as possible after the completion of finishing operations. The Prime/Curing material shall be in accordance with ARTICLE 12 of this Manual.

Section 11.08 TESTING SURFACE

The finished surface of the base course shall be checked with a template cut to the required cross section and with a 15 foot straight edge laid parallel to the centerline of the road or other approved testing devices. All irregularities greater than $\pm\frac{1}{4}$ inch shall be corrected by scarifying and removing or adding rock, as may be required, after which the entire areas shall be re-compacted as specified herein. All corrective material and rework is at the contractor's expense.

Section 11.09 TESTS

Testing shall be done in accordance with ARTICLE 15 of this Manual.

Section 11.10 DEFICIENCIES

If deficiencies in the density occur, the base shall be reworked and re-compacted until the density tests conform to these Specifications. All work to repair said deficiencies will be at the contractor's expense.

Any deficiencies in thickness of base greater than $\frac{1}{2}$ inch shall require that the entire base be reworked to conform to the original line and grade and specifications as shown on the original plans. Except, at the City Engineer's discretion, such deficient base thickness may be left in place if the deficiency can be made up in asphaltic surface course.

Section 11.11 OPENING TO TRAFFIC

The Contractor shall not be permitted to drive heavy equipment over the completed sections. Light weight pneumatic-tired equipment may be permitted after the surface has hardened sufficiently to prevent the equipment from marking the surface and provided the protection and curing specified are not impaired. Completed section may be opened to light traffic after 24 hours, provided the surface has hardened sufficiently to prevent marking by traffic and has been inspected by the City Engineer or his Designee. An application of sand shall only be done prior to opening to construction traffic.

Section 11.12 MAINTENANCE

The Contractor shall maintain the base to a true and satisfactory surface until the wearing surface is constructed. Should any repairs or patching be necessary, they shall extend to the full depth of the base and shall be made in a manner that will assure restoration of a uniform base course conforming to the requirements of these Specifications. The bituminous curing coating shall be maintained until the wearing surface is constructed.

ARTICLE 12

PRIME AND TACK COATS FOR BASE COURSES

Index	12.01	<u>GENERAL</u>
	12.02	<u>MATERIALS</u>
	12.03	<u>EQUIPMENT</u>
	12.04	<u>CLEANING THE BASE</u>
	12.05	<u>WEATHER LIMITATIONS</u>
	12.06	<u>APPLICATION OF PRIME COAT</u>
	12.07	<u>APPLICATION OF TACK COAT</u>

[BACK TO TABLE OF CONTENTS](#)

Section	12.01	<u>GENERAL</u>
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The work specified in this ARTICLE consists of the application of bituminous material, on a previously prepared base, in accordance with these Specifications and in conformity with the lines, grades, dimensions, and notes shown on the plans.

All prime and tack coats installed will comply with the FDOT Standard Specifications for the Road and Bridge Construction, most current edition.

Section	12.02	<u>MATERIALS</u>
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The materials used shall be as follows:

12.02.01	<u>Prime Coat</u>
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A) Cutback Asphalt, Grade RC-SS-1, SS-1H, Special MS-Emulsion, diluted at the ratio of 6 parts emulsified asphalt to 4 parts water.

B) Cutback Asphalt, Grade RC-70.

12.02.02	<u>Tack Coat</u>
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A) Asphalt Cement, Viscosity Grades AC-20 or AC-30.

B) Emulsified Asphalt, Grade RS-2, SS-1, SS-1H, Special MS-Emulsion, diluted at the ratio of 6 parts emulsified asphalt to 4 parts water.

For the prime and tack coat, any one of the specified bituminous materials may be used at the option of the Contractor, unless a specific type and grade is called for on the plans.

Section 12.03 EQUIPMENT

This work may be performed with any machine, combination of machines, or equipment that will produce the specified results.

Section 12.04 CLEANING THE BASE

Before any bituminous material is applied, all loose material, dust, and foreign material, which might prevent proper bond with existing surface, shall be removed for the full width of the application. Particular care shall be taken to clean the outer edges of the strip to be treated in order to insure that the prime or tack coat will adhere. Where the prime or tack coat is applied adjacent to curb and gutter or valley gutter, such concrete surfaces are to be protected and kept free of bituminous materials.

Section 12.05 WEATHER LIMITATIONS

No bituminous material shall be applied when the temperature of the air is less than 40° F in the shade, or when the weather conditions or the condition of the existing surface is unsuitable.

Section 12.06 APPLICATION OF PRIME COAT

The surface to be primed shall be clean and free of standing water. For limerock bases the glazed finish shall be removed, leaving a granular or porous condition that will allow free penetration of bituminous material. The temperature of the prime material shall be between 100° F and 150° F. The actual temperature shall be that which will insure uniform distribution. The material shall be applied by means of a pressure distributor. The amount of bituminous material applied shall be not less than 0.10 gallon per square yard for limerock base and not less than 0.15 gallon per square yard for soil cement, or shell base. The amount to be applied will be dependent on the character of the surface and shall be sufficient to coat the surface thoroughly and uniformly, with no excess. Where asphaltic pavement abuts concrete curbing, the vertical abutting edge shall receive a uniform coating of tack applied so as to avoid puddles, etc.

A light uniform application of clean sand shall be applied prior to opening the primed base to traffic, in which case the sand shall be rolled with a traffic roller. If warranted by traffic conditions, the application shall be made only on one-half of the width of the base at one time, care being taken to secure the correct amount of bituminous materials at the joint.

The base shall be sufficiently moist in order to obtain maximum penetration of the asphalt.

Section**12.07****APPLICATION OF TACK COAT**

Where a bituminous surface is to be laid and a tack coat is required, it shall be applied as herein specified. On newly constructed base courses, the application of the tack coat, when required, shall follow the application of the prime coat, immediately prior to placing the wearing surface. In general, a tack coat shall not be required on primed bases, except in areas which have become excessively dirty and cannot be cleaned, where the prime has cured and lost bonding effect, or where the prime coat has worn away. The tack coat shall be applied with a pressure distributor. The bituminous material shall be heated to a suitable consistency as designed or as stated in Section 11.06. The bituminous material shall be applied at the rate between 0.02 gallon and 0.08 gallon per square yard. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying, but shall not be applied so far in advance or over such an area as to lose its adhesiveness as a result of being covered with dust or other foreign material and shall be kept free from traffic until the wearing surface is laid.

ARTICLE 13

ASPHALTIC CONCRETE SURFACE COURSE

Index	<u>13.01 GENERAL</u>
	<u>13.02 ASPHALTIC CONCRETE MIXES</u>
	<u>13.03 MECHANICAL SPREADING and SCREEDING EQUIPMENT</u>
	<u>13.04 CONSTRUCTION METHODS</u>
	<u>13.05 FINISHED SURFACE REQUIREMENTS</u>
	<u>13.06 SUBMITTALS</u>

[**BACK TO TABLE OF CONTENTS**](#)

Section	<u>13.01 GENERAL</u>
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The work specified in this ARTICLE consists of the application of asphaltic concrete surface course. This course shall be composed of a mixture of aggregates and, if necessary, mineral filler and asphalt cement to produce the desired stability as hereinafter described, properly laid upon a prepared base in accordance with these Specifications and in conformity with the lines, grade, thickness and typical cross section shown on the plans. This work shall include the conditioning of the existing surface or base. Skid resistant surfaces shall be installed as required by the City Engineer.

All asphalt pavement installed will comply with the FDOT Standard Specifications for the Road and Bridge Construction, most current edition.

Section	<u>13.02 ASPHALTIC CONCRETE MIXES</u>
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All thicknesses mentioned in these Specifications and/or shown on the project Drawing shall be an average thickness computed as follows:

The minimum thickness allowed shall be $\frac{1}{4}$ inch less than the required average thickness. Thickness in excess of $\frac{1}{4}$ inch of the required average thickness shall be computed at the design thickness plus $\frac{1}{4}$ inch in computing the average thickness.

The thickness of the pavement shall be determined from the length of core, at least 2 inches in diameter, taken at random points on the cross section and along the roadway. Each core shall represent a section not longer than 250 feet. The average thickness shall be determined from the measured thicknesses.

If the Contractor believes that the number of cores taken is insufficient to properly indicate the thickness of the pavement, additional cores can be requested at locations designated by the Contractor. These and any additional costs shall be born by the Contractor.

When the deficiency in thickness is in excess of $\frac{1}{4}$ inch, the Contractor shall correct the deficiency either by replacing the full thickness for a length extending at least 50 feet from each end of the deficient area, or (when permitted by the City Engineer or his Designee) by overlaying. Normally an overlay shall not be permitted in a concrete curb section.

Asphaltic concrete mixes shall meet the following Specifications when called for in the plans and specifications:

Table 13-1				
Type	Job Mix Specification	Min/Avg Compacted (Max Lift)	Minimum Marshall Stability	Application
Type S-1 (S-I)	*	1 ¼" 2 ½"	1,500 lb	Wearing Course
Type S-2 (S-II)	*	2" 2 ¾"	1,000 lb	Wearing Course
Type S-3 (S-III)	*	¾" 1 ½"	1,500 lb	Wearing Course
Type FC-5	Current FDOT Specification	(¾")	N/A	Friction Course
Type FC-9.5	*	Refer to FDOT Specification	N/A	Friction Course
Type FC-12.5	*	Refer to FDOT Specification	N/A	Friction Course
Type SP-9.5	Current FDOT Specification	1" 1 ½"	N/A	Structural Course
Type SP-12.5	Current FDOT Specification	1 ½" 2 ½"	N/A	Structural Course
Type SP-19	Current FDOT Specification	2" 3"	N/A	Structural Course

* <http://www.dot.state.fl.us/specificationoffice/Implemented/LAP/Archives/Asphalt/Default.shtm>

Section 13.03 MECHANICAL SPREADING and SCREEDING EQUIPMENT

Bituminous pavers shall be self-contained, self-propelled and steerable. It shall be equipped with a receiving and disbursing hopper capable of holding a minimum quantity of 5 cubic yards of bituminous plant mix material permitting a uniform spreading operation. The hopper shall be equipped with a conveyor distribution system to place the mixture uniformly in front of the screed.

The paver shall also be equipped with a heated mechanical screed or strike-off assembly. The screed or strike-off shall be capable of adjustment to regulate the depth of material spread and shall produce a finished surface of the required evenness and texture, without tearing, shoving, or gouging the mixture.

Section**13.04****CONSTRUCTION METHODS**

The mixture shall be spread on the designated surface only when the surface previously prepared is intact, firm, properly cured and dried, and only when the air temperature in the shade and away from artificial heat is above 40° F and rising.

The mixture shall be delivered on the road in ample time to permit the spreading, rolling and surface testing during daylight hours. The temperature of the mixture at the time of spreading shall be between 260° and 310° F and shall not exceed 340° F at the plant.

Material shall be delivered to the job site with sufficient frequency that the paving operation can continue without interruption.

Depressions which may develop after the initial rolling shall be remedied by removing the mixture laid and adding new material to bring such depressions to a true surface. Such portions of the completed course that are defective in surface planeness, compaction or composition, or that do not comply with the requirements of these Specifications shall be removed and replaced with suitable mixture properly laid in accordance with these Specifications.

Vertical construction joints shall be constructed prior to the commencement of the ongoing paving operation. All cold joints shall be prepared according to the FDOT Specifications. The vertical surface of all existing asphaltic concrete mixes, at cold joints, shall be mopped with an approved liquid bitumen material so as to provide a water-tight joint at the interface of the two mixes.

Section**13.05****FINISHED SURFACE REQUIREMENTS**

For the purpose of testing the finished surface, the Contractor shall provide a 15 foot rolling straight edge (to include a recent certification of calibration) and standard template cut to the true cross section of the road. These shall be available at all times during construction so that the City may check the finished surface. The Contractor shall provide and designate an employee whose duty it is to use the straight edge and template in checking all rolled surface under the direction of the City. Vertical measurement from a string line between curbs, to determined crown, may be accepted as an alternate. The finished surface shall be such that it will not vary more than ¼ inch from the 15 foot rolling straight edge applied parallel to the centerline of the pavement and shall be of uniform texture and compaction. The lip of the asphalt shall be higher than the gutter by ¼ to ½ inch. The surface shall have no pulled, torn or loosened portions and shall be free from segregation, sand streaks, sand spots, or ripples. Irregularities of the surface, exceeding the above requirements, shall be corrected by the Contractor who has the option of selecting one of the following methods:

- A) Removing and Replacing - If correction is made by removing and replacing the pavement, the removal must be for the full depth of the course and extend at least 50 feet on either side of the defective area, for the full width of the paving lane.

- B) Overlaying - If correction is made by overlaying, the overlay shall cover the length of the defective area and taper uniformly to a feather edge thickness at a minimum distance of 50 feet on either side of the defective area. The overlay shall extend full width of the roadway. Care shall be taken to maintain the specified cross slope. The mix used for the overlay may be adjusted as necessary for this purpose by the City Engineer. Overlaying shall not be permitted when the finished pavement surface is a friction course or abuts concrete curbs.
- C) Other Methods - For courses which will not be the final pavement surface, correction of minor straightedge deficiencies by methods other than specified above may be approved by the City Engineer.

The City Engineer or his Designee may require in-laid type pavement markings or alkyd thermoplastic pavement markings at the time of the final course application.

Section 13.06 SUBMITTALS

Prior to the start of the placing of the asphaltic concrete, the job mix formula prepared by a certified material testing laboratory shall be submitted to and be approved by the City Engineer or his Designee. All job mix design formulas shall be current within the last 12 months.

The following items may be required by the City Engineer or his Designee:

- A) Plant inspection and calibration check.
- B) Aggregate verification.
- C) Temperature control and verification.

ARTICLE 14

PORTLAND CEMENT CONCRETE PAVEMENT

Index	14.01	<u>GENERAL</u>
	14.02	<u>SUBGRADE PREPARATION FOR RIGID PAVEMENT</u>
	14.03	<u>MATERIALS, PROPORTIONING AND CONSTRUCTION FOR RIGID PAVEMENTS</u>
	14.04	<u>EQUIPMENT</u>
	14.05	<u>MIXING AND PLACING FOR RIGID PAVEMENT</u>
	14.06	<u>FINISHING</u>
	14.07	<u>CURING FOR RIGID PAVEMENTS</u>
	14.08	<u>JOINTS IN RIGID PAVEMENTS</u>
	14.09	<u>FINAL ACCEPTANCE FOR RIGID PAVEMENTS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	14.01	<u>GENERAL</u>
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Rigid pavement consists of constructing a specified Portland Cement Concrete Paving on a prepared subgrade. The utilities and other items in and beneath the street must be properly coordinated with the construction of rigid pavement to avoid all conflicts. The work to be done shall include the furnishing of all supervision, labor, materials, equipment and incidentals necessary for the proposed rigid pavement construction in accordance with the approved Drawings and specifications.

All rigid pavement installed will comply with the FDOT Standard Specifications for the Road and Bridge Construction, most current edition.

Section	14.02	<u>SUBGRADE PREPARATION FOR RIGID PAVEMENT</u>
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	14.02.01	<u>General</u>
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The bottom of the excavation for the pavement or top of the earth fill will be known as the pavement subgrade and shall conform to the lines, grade and cross sections shown on the plans.

Prior to placing the concrete, the subgrade shall be tested for conformity with the cross section shown on the plans. If necessary, material shall be removed or added as required to bring all portions of the subgrade to the correct elevation. Concrete shall not be placed on any portion of the subgrade which has not been tested for correct elevation. The subgrade shall be cleared of all debris, including tree roots, stumps, and loose material. If at any time trucks, construction equipment or slip forming machines cause rutting or displacement of the subgrade materials, the subgrade shall be reshaped and compacted. The subgrade shall be in a moist condition at the time the concrete is placed.

14.02.02 Subgrade Material

The top 6 inches shall be composed of well drained granular soils that are predominantly sandy, mixed with no more silt or clay than required to obtain a Florida bearing value of 50 plus or minus 5 and be compacted to a minimum density of 98% of maximum density in accordance with AASHTO T-180.

Section 14.03 MATERIALS, PROPORTIONING AND CONSTRUCTION FOR RIGID PAVEMENTS

The materials and proportioning shall be in accordance with ACI Standard 318, latest edition. All construction procedures shall be in accordance with FDOT Standard Specifications for Road and Bridge Construction, latest edition.

14.03.01 Strength Required

All concrete shall have a minimum compressive strength of 3,000 psi at 28 days. Conformance to strength requirements shall be determined by ACI Standard 318, latest edition.

14.03.02 Slump

The mixture shall contain no more water than is necessary to produce concrete which is workable and plastic. The minimum slump necessary to place the concrete satisfactorily shall be used. Slumps shall be maintained so as not to exceed 4½ inches for non-vibrated placement nor to exceed 5 inches for vibrated placement.

The design mix shall be submitted to the City Engineer and Construction Manager for approval prior to paving.

Section 14.04 EQUIPMENT

14.04.01 Forms

The pavement shall be placed to lines and grades established by the Engineer. The edges of pavement shall be vertical to the subgrade and forms shall be sufficient to support mechanical equipment.

14.04.02 Ready Mixed Plants

The plant shall be in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. All plants must be DOT certified or approved by the City Engineer.

14.04.03 On-Site Central Mix Plants

The plant shall be in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. The trucks used to transport the concrete shall be so constructed to prohibit segregation of the mix. All plants must be DOT certified or approved by the City Engineer.

14.04.04 Paver

All equipment used in the placement of concrete pavements shall conform to FDOT Standard Specifications for Road and Bridge Construction, latest edition.

Section **14.05 MIXING AND PLACING FOR RIGID PAVEMENT**

14.05.01 General

Concrete pavement shall be constructed on the prepared subgrade in accordance with these Regulations and in conformity with the lines, grades, thickness, and typical cross sections shown on the construction plans. Concrete pavement shall meet the following Minimum thickness requirements.

Table 14-1		
Minimum Type of Development	Roadway Classification	Concrete Thickness
Residential	Marginal Access and Parking Areas	6"
	Local Street	8"
	Minor Collector Street	8"
	Major Collector Street	8"
Industrial and Commercial	Marginal Access and Parking Areas	6"
	Minor Street	8"
	Collector Street	8"

14.05.02 Transporting Concrete

Concrete may be transported any distance providing it is discharged on the grade with the slump within the required slump range and meets concrete time limit requirements. If additional water is required to maintain the specified slump of concrete transported in the truck mixers, it may be added with the permission of the City Engineer or his Designee. In this case, a minimum of 25 additional revolutions of the mixer drum at designed mixing speed shall be required before discharging of the concrete. All concrete deliveries shall be accompanied by a batch time stamped on the delivery ticket by means of a mechanical time clock. Batch time shall be an accurate time of concrete batch and delivery truck departure from the batch plant.

14.05.03 Concrete Time Limit

The length of time that the concrete can be held in the truck shall conform to the following:

- A) Air temperature 45°F to 80°F, 90 minutes.
- B) Air temperature over 80°F with a retarder added to the mix, 90 minutes maximum.
- C) Air temperature over 80°F without a retarder added to the mix, 60 minutes maximum.
- D) The maximum temperature of the concrete at the time of placing shall be 95°F.

14.05.04 Placing Concrete

The concrete shall be deposited on the grade in such a manner as to require as little re-handling as possible. It shall be deposited in successive batches in a continuous operation. The concrete shall be consolidated by suitable means so as to preclude the formation of voids or honeycomb pockets.

14.05.05 Placing in Cold Weather

Concrete shall only be placed when the temperature is at least 40°F and rising. Any concrete damaged by frost action shall be removed and replaced.

Section

14.06 FINISHING

14.06.01 General

The concrete shall be struck-off, consolidated, and finished with mechanical equipment in such a manner that after final finishing, it shall conform to the pavement cross section shown on the construction plans. Hand finishing shall be permitted in narrow widths, in areas of irregular dimensions, or in the event of breakdown of the mechanical equipment, only to finish the concrete already deposited on the grade.

14.06.02 Final Surface Finish

The final surface of the pavement shall have uniform, skid-resistant texture. The method of texturing shall be approved by the City Engineer or his Designee and may require change in the final finishing procedure as required to produce the desired final surface texture. A burlap drag or transverse broom finish is recommended for local and collector streets. Arterial and rural roads may require an overlapping stiff bristled broom or steel comb finish at the discretion of the City Engineer or his Designee.

14.06.03 Pavement Exposed to Rain During Construction

The Contractor shall always have materials available to protect the surface of the plastic concrete against rain. Areas of the pavement surface that exhibit a smooth, sandy appearance after the rain ceases shall be textured before applying the membrane curing materials. Areas that have suffered surface erosion and have coarse aggregate exposed, and have not yet hardened, shall be reworked by hand methods or with the finishing machine when the form paving method is used. Fresh concrete containing the same materials and properties as the pavement concrete shall be added to maintain an adequate supply in front of the screeds or machine to assure replacement of the concrete eroded from the surface. The surface shall then be textured and cured as specified.

If pavement edges have been severely eroded and the concrete has not set, the edges shall be repaired by setting side forms and replacing eroded concrete. After the side forms are set, fresh concrete shall be placed and finished prior to texturing and curing. After the pavement has hardened, remedial work shall not be permitted until after the curing period has terminated.

Section 14.07 CURING FOR RIGID PAVEMENTS

14.07.01 General

After finishing operations have been completed and immediately after the free water has left the surface, the surface of the slab and the sides of the slab, for slip formed pavement, shall be coated and sealed with a uniform layer of membrane curing compound. The curing compound shall be applied at the rate of not less than 1 gallon per 200 square feet of surface. When the forms are removed, curing compound shall be applied to the sides of the slab. Areas in which the curing membrane is damaged shall be re-sprayed with curing compound within a period of 3 days.

Curing compound may be omitted when, in conjunction with protection of pavement from inclement weather, a polyethylene film or other acceptable material is applied over the pavement and maintained intact for 3 days.

14.07.02 Cracks

Concrete rigid pavement shall not be accepted with excessive uncontrolled cracks. Shrinkage cracks must be avoided.

Uncontrolled cracks 1/16 inch or larger in width shall be repaired. One of the following repair methods shall be used:

- A) Remove and Replacement.
- B) Widen with power router and fill with an approved joint sealant.
- C) Epoxy grout injection.

The City Engineer or his Designee shall determine which cracks are to be repaired and the method to be used.

Section 14.08 JOINTS IN RIGID PAVEMENTS

14.08.01 General

Transverse and longitudinal joints shall be constructed to a maximum spacing of 15 feet. Transverse joints shall extend the entire width of the pavement and through the curbs.

Sawing of joints shall begin 4 to 6 hours after placing concrete or as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling and before uncontrolled cracking occurs. If necessary, the sawing operations shall be carried on both day and night, regardless of weather conditions.

14.08.02 Construction Joints

Longitudinal joints may be construction joints at the discretion of the City Engineer or his Designee. Transverse construction joints shall be installed whenever the placing of concrete is suspended a sufficient length of time for the concrete to begin to harden.

14.08.03 Joint Sealing

Joints shall be sealed, if required, before the pavement is exposed to traffic, including construction traffic. Prior to sealing, all foreign material shall be removed from the joints and the joints shall be thoroughly dry.

Section 14.09 FINAL ACCEPTANCE FOR RIGID PAVEMENTS

14.09.01 General Acceptance for Rigid Pavements

Before the pavement shall be considered for acceptance, all items shall be complete in accordance with the construction plans and these Regulations. Equipment, surplus materials, and construction debris shall be removed from the project.

14.09.02 Opening to Traffic

The pavement shall be closed to traffic after the concrete is placed until it reaches a compressive strength of 3,000 psi under ordinary field conditions. This does not include the sawing and sealing equipment or other light miscellaneous equipment. New roadways shall be closed to public traffic until approved by the City Engineer or his Designee.

14.09.03 Testing of Concrete

Concrete pavement shall have a 28-day compressive strength of 3,000 psi. Portland Cement Concrete control for slump testing, and concrete cylinder samples and testing is required and shall be in accordance with AASHTO and ASTM Specifications, latest editions. Test reports shall be submitted to the City Engineer or his Designee by the Engineer of Record for review of all non-public improvements. All tests on public improvements shall be conducted by a Geotechnical/Soils Engineer under contract to the City. Final acceptance shall be based on testing in accordance with other paving requirements. Failed tests or additional tests are at Contractor's expense.

ARTICLE 15

QUALITY CONTROL

Index	15.01 <u>GENERAL</u>
	15.02 <u>INSPECTIONS AND TESTS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	15.01	<u>GENERAL</u>
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Developments within the City of Ocoee which have improvements to be dedicated (property, utilities, and rights-of-way) or granted (easements) to the City shall require quality control assurances. The cost for these assurances shall be three (3) percent of the total construction cost of the dedicated and/or granted improvements. This is part of the requirements of a Right-of-Way Utilization Permit.

Section	15.02	<u>INSPECTIONS AND TESTS</u>
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Staged inspections during construction are required. It is the responsibility of the Owner/Developer, or their Contractor, to notify the City Engineer or their Designee to arrange for these inspections. All tests shall be the responsibility of the Owner/Developer unless otherwise stated in the following paragraph.

Tests which are required under this Manual shall be performed by a competent engineering testing laboratory. This laboratory shall have an Engineer registered in Florida as one of the responsible officials of the firm. All tests on facilities to be dedicated to the public shall be performed by a City contracted or approved engineering firm. All such materials testing costs shall be paid for by the Owner/Developer. In accordance with City Policy, the Contractor shall reimburse the City for any extra costs incurred due to the retesting of failing portions of the project to be dedicated to the public. During construction and upon completion of the following construction stages, the Developer/Contractor shall notify the City that each stage is ready for inspection, and will await clearance by the City Engineer or their Designee before proceeding to the next stage:

- A) Work zone traffic control.
- B) Clearing and grubbing.
- C) Utility systems (sanitary sewer facilities only).
- D) Storm water facilities.
- E) Removal of unsuitable material.
- F) Stabilization of subgrade.

- G) Underdrains.
- H) Curb and gutter (including backfill behind curbing).
- I) Inlets, box culverts, and all other concrete structures when steel is in place prior to pouring.
- J) All underground utilities within right-of-way, including but not limited to water, wastewater, irrigation, electric, street lighting wiring and bases, cable television, telephones, gas, etc. shall be in place and an inspection approval on file with the Construction Manager prior to proceeding.
- K) Base course during construction or mixing.
- L) Traffic Signal Systems.
- M) Finishing base course prior to paving.
- N) Wearing surface during application.
- O) Sidewalks, driveway approach, dumpster pads, and other reinforced structures (pre-pour).
- P) Sodding and/or landscaping.
- Q) Cleanup and dressing of right-of-way limits.
- R) Pavement marking and traffic control signage.
- S) Street name signs.
- T) Final inspection.

The City requires a 24-hour notice of said scheduled inspections. The purpose of these inspections is to ensure compliance with the approved development plan and to advise the City whether or not the roads, traffic controls, storm drainage, utilities, and other required improvements being constructed appear to qualify for acceptance by the City. The City accepts no responsibility or liability for the work, or for any contractual conditions involving acceptance, payment, or guarantees between the Contractor and the Developer, by virtue of these stage inspections. The City assumes no responsibility or commitment guaranteeing acceptance of the work, or for subsequent failure, by virtue of these stage inspections. However, if any aspect of the work being performed does not comply with acceptable standards, corrections will be required by the City as a condition for City acceptance. All required improvements shall be installed and have the approval of the City prior to acceptance by the City.

Inspection of Private Facilities

Inspections and verifications of private streets and drainage facilities in approved developments shall be conducted by the City to verify that they are being constructed in accordance with the approved plans for the project.

ARTICLE 16

CULVERTS AND STORM SEWERS

Index	16.01	<u>GENERAL</u>
	16.02	<u>PIPE</u>
	16.03	<u>LAYING PIPE</u>
	16.04	<u>BACKFILLING</u>
	16.05	<u>PIPE FOUNDATIONS</u>
	16.06	<u>TESTS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	16.01	<u>GENERAL</u>
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The work in this ARTICLE shall consist of furnishing and installing culverts and storm sewers with appurtenances in conformance with the Specifications hereafter described and of the sizes and dimensions shown on the plans. Storm sewer pumping stations shall in general conform to the Specifications for sanitary sewer lift stations. All products shall be FDOT approved materials.

Section	16.02	<u>PIPE</u>
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16.02.01	<u>Concrete Pipe</u>
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Concrete pipe shall be of first quality, conforming to the most current ASTM Designation C-76. Pipe requirements shall be shown on the plans. Class III reinforced concrete pipe is the minimum acceptable classification. Lifting holes are prohibited.

The joints shall have a continuous O-ring rubber gasket, or approved equal, which fits snugly in the annular space between the beveled surfaces of the tongue and groove ends of the pipe to form a flexible watertight joint under all conditions of service. There shall be no exposed metal in the joint, except that allowed by ASTM and FDOT for “chairs”. All concrete pipe joints shall be wrapped with filter fabric. Filter fabric shall conform to ARTICLE 18 of this Manual. Filter material shall extend a minimum of 1 foot both sides of the joint and a 2 foot overlap on the top. All joints shall prevent soil from infiltration into the pipe.

16.02.02	<u>Alternative Material Pipes</u>
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Alternative pipe materials may be allowed upon the submittal by the Project Engineer and approval by the City Engineer.

Section 16.03 LAYING PIPE

All pipe shall be carefully laid, true to the lines and grades as shown on the plans. For pipe laid with rubber gasket joints, any deviation from true alignment or grade, which would result in a displacement from the normal position of the gasket of as much as ¼ inch, or which would produce a gap exceeding ½ inch between sections of pipe for more than 25% of the circumference of the inside of the pipe, shall not be acceptable. If this occurs the pipe shall be removed and re-laid. Where minor imperfections in the manufacture of the pipe cause a gap greater than ½ inch between pipe sections, the joint will be acceptable provided the gap does not extend more than 25% of the circumference of the inside of the pipe. No mortar, joint compound, or other filler which would tend to restrict the flexibility of the gasket joint shall be applied to the gap. All pipe shall be laid “in-the-dry” unless specifically authorized otherwise by the City Engineer.

Section 16.04 BACKFILLING

Backfilling shall progress as rapidly as the construction and testing of the work will permit. All backfill material shall be suitable and free of deleterious material. The initial backfill shall be carefully deposited on both sides of the pipe at the same time and uniformly compacted around the barrel of the pipe until enough has been placed to provide a cover of 1 foot above the crown of the pipe. In no case shall backfill material be placed in the trench in a manner that will cause shock to or unequal pressure on the pipe. The backfill shall be placed and compacted to a minimum density of 98% of the maximum density value as determined by AASHTO T-180. Under no conditions shall construction debris, concrete, etc., be included with the backfill. All backfill in existing pavement areas shall be non-shrinkable fill unless this requirement is waived by the City Engineer.

Section 16.05 PIPE FOUNDATIONS

Where the nature of the foundation materials is of poor supporting value, the foundation material shall be consolidated by mechanical methods, replaced with sand or other material by constructing supporting cradles, or as approved by the City Engineer or his Designee.

Section 16.06 TESTS

Compaction tests shall be required for the first lift around the pipe and one test for each 1 foot lift above that to the subgrade for each 200 linear feet of pipe as a minimum. The City Engineer or his Designee may determine that more or fewer tests are required to certify the installation depending on the field conditions.

ARTICLE 17

INLETS AND MANHOLES

Index	17.01	<u>GENERAL</u>
	17.02	<u>MATERIALS</u>
	17.03	<u>FOUNDATIONS</u>
	17.04	<u>FORMS</u>
	17.05	<u>PLACING AND CURING CONCRETE</u>
	17.06	<u>MASONRY CONSTRUCTION</u>
	17.07	<u>PRECAST INLETS AND MANHOLES</u>
	17.08	<u>PLACING PIPE</u>
	17.09	<u>FLOW CHANNELS</u>
	17.10	<u>INLET PLACEMENT</u>
	17.11	<u>MANHOLE COVERS AND RINGS</u>
	17.12	<u>DIAMETER</u>
	17.13	<u>ACCESS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	17.01	<u>GENERAL</u>
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The work specified in this ARTICLE shall consist of constructing inlets and manholes. These structures shall be constructed of Portland cement concrete and reinforcing steel with the necessary metal frames and gratings. They shall be constructed in conformity with the detailed plans and in accordance with this Manual and FDOT Standard Specifications. Stormwater and sewer facilities shall be in accordance with this Manual.

Section	17.02	<u>MATERIALS</u>
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Concrete shall be Class I (Class II for sanitary sewer) and have a minimum compressive strength of 4,000 psi at 28 days. The mortar for masonry shall be of Portland cement and sand mixed in the proportions of 1 part cement to 3 parts of sand. At the option of the Contractor, high early strength cement may be used. All items shall be wet cast. Dry casting or low slump concrete shall not be allowed. There shall be no penetrating lifting holes on any structures, and no holes will be allowed within 6 inches of any joint on structures. Brick manholes shall not be permitted.

Section	17.03	<u>FOUNDATIONS</u>
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Compaction shall be to a minimum density of 98% of the maximum density determined by AASHTO T-180 for 12 inches, then stabilized using a 9 inch layer of crushed rock in a filter fabric envelope.

Section 17.04 FORMS

Forms shall be built true to line and grade, braced in a substantial and unyielding manner and so designed and constructed that they may be removed without injury to the concrete.

Section 17.05 PLACING AND CURING CONCRETE

The concrete shall be placed in the forms to the depth shown on the plans and thoroughly tamped and spaded. After the concrete has hardened sufficiently, it shall be covered with suitable material and kept moist for a period of 3 days or longer, if necessary, and shall be protected in a satisfactory manner from the elements until thoroughly cured.

Section 17.06 MASONRY CONSTRUCTION

Masonry construction shall be limited to completion of doghouses around pipes, adjusting manhole covers, etc., or as approved by the City Engineer. It is the intent of this Manual that structures be constructed of precast concrete or cast in place concrete. All clay brick used shall be solid and conform to the current ASTM Designation C-55 Grade P-11.

Section 17.07 PRECAST INLETS AND MANHOLES

Precast manholes, inlets and junction boxes shall be in accordance with ASTM C-478. Top elevation adjustment of the manhole top shall be adjustable between 6 inches and 12 inches using precast concrete rings or cast in-place concrete, minimum compressive strength of 3,000 psi. No brick will be accepted for the main structure. Vertical walls of manhole entrances shall not exceed 19 inches in length including the ring and cover.

Section 17.08 PLACING PIPE

The inlet and outlet pipes shall be flush with the inside face of the wall. Mortar bonding shall be required between pipe and structure wall. Concrete to PVC adapters shall be required when PVC pipes are connected to concrete structures.

Section 17.09 FLOW CHANNELS

Flow channel to be precast in place or cast in-place concrete, minimum compressive strength of 3,000 psi. Fillers of any other material will not be accepted. A flow channel shall be formed in the invert of all inlets, manholes and junction boxes and shall extend to the spring line of the pipe. The flow channel through manholes shall be made to conform in shape and slope to the lower 0.8 diameter of the inlets and outlets. Flow direction changes in excess of 90° shall not be included in sewer alignments without special consideration. When directional changes exceeding 45° occur, an additional flow line elevation drop of 0.1 foot across manholes shall be provided. Straight-through channels may be formed with pre-cut half pipes. Benching shall be provided with a minimum slope of 2 inches per foot.

In general, manhole drop connections are not allowed. The City may allow such connections on a case by case basis. These connections shall only be considered when other alternatives are not feasible. If allowed, an outside drop pipe shall be provided for a sewer entering a manhole where its invert elevation is 24 inches or more above the manhole invert. Where the difference in elevation between the incoming sewer invert and the manhole invert is less than 24 inches, the manhole invert shall be filleted to prevent solids deposition.

Section 17.10 INLET PLACEMENT

Radial inlets are prohibited. All inlets must be placed on tangents.

Section 17.11 MANHOLE COVERS AND RINGS

Covers and rings for manholes shall conform to the Approved Manufacturers List for Model Numbers. The cover shall have the wording “City of Ocoee”, “Florida” and either “STORM” or “SANITARY” based on application cast into the face as specified in the Typical City Details.

All manhole rings and covers shall be made watertight by means of dovetail grooves and gaskets in the cover. Bolt down and/or gasketed covers shall be provided where manholes are located in areas subject to ponding or flooding. Frames and covers shall be set to conform to the finished grades. All frames shall be set securely in a cement mortar bed and fillet. All covers shall be made flush with existing permanent surfaces except outside the limits of the traveled ways where they shall be set approximately 0.2 feet above the existing ground unless otherwise noted.

Covers and rings for storm inlets with cast in-top ring shall conform to the Approved Manufacturers List for Model Numbers.

Section 17.12 DIAMETER

For pipe sizes 24 inches in diameter and smaller, the minimum inside diameter of manholes shall be 48 inches. For pipe sizes between 24 and 36 inches, the minimum inside diameter shall be 60 inches. For pipe sizes larger than 36 inches in diameter, a 72 inch inside diameter manhole shall be provided

Section 17.13 ACCESS

A 10 foot wide access road and minimum 20 foot easement shall be provided for all structures to be dedicated to the public which are located outside of City roadways. The top 8 inches of the access road shall be stabilized to FBV 50, and compacted to a minimum density of 98% of the maximum density as determined by AASHTO T-180.

ARTICLE 18

UNDERDRAINS

Index	18.01	<u>GENERAL</u>
	18.02	<u>MATERIALS</u>
	18.03	<u>EXCAVATION TRENCH</u>
	18.04	<u>PLACING THE FILTER FABRIC</u>
	18.05	<u>LAYING THE PIPE</u>
	18.06	<u>PLACING AND COMPACTING FILTER AGGREGATE</u>
	18.07	<u>BACKFILL ABOVE FILTER AGGREGATE</u>
	18.08	<u>CERTIFICATION</u>
	18.09	<u>ACCEPTANCE OF UNDERDRAINS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	18.01	<u>GENERAL</u>
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The work specified in this ARTICLE consists of the construction of underdrains. Underdrain pipe shall have a minimum diameter of 8 inches, unless otherwise approved by the City Engineer. Underdrains shall be required in all cases unless explicitly deleted by the City Engineer.

Section	18.02	<u>MATERIALS</u>
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The materials used shall conform to the following requirements.

18.02.01	<u>Filter Fabric</u>
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Filter fabrics for use in underdrains shall conform to the following properties, minimum (use Mirafy 140 or approved equal):

<u>Table 18-1</u>			
<u>Fabric</u>	<u>Test Method</u>	<u>Unit</u>	<u>Typical Value</u>
Grab Tensile Strength	ASTM D-1682	lb	120
Grab Tensile Elongation	ASTM D-1682	%	55
Trapezoidal Tear Strength	ASTM D-1117	lb	50
Mullen Burst Strength	ASTM D-3786	psi	210
Puncture Strength	ASTM D-3787	lb	70
Water Flow Rate	CEMC-GET-2	gal/min/sf	285

18.02.02 Pipe Wrap

The filter fabric pipe wrap shall be an approved strong, tough, porous nylon, polyester, polypropylene or other approved fabric. It shall be secured to and completely cover the perforated plastic tubing pipe underdrain to prevent infiltration of trench backfill material. The filter envelope shall weigh a minimum of 4 ounces per square yard and shall retain soil particles larger than 212 microns (No. 70 sieve) when tested in accordance with ASTM D-1682. The grab strength (wet) of the filter wrap shall not be less than 100 lbs and the grab elongation shall not be less than 60%. Storage and handling of filter envelope shall be in accordance with the manufacturer's recommendation. Torn or punctured filter wrap shall not be used.

18.02.03 Filter Aggregate (Fine Aggregate)

Sand used for backfilling trenches under, around and over underdrain pipe shall consist of hard, durable, clean quartz and shall be reasonably well graded, from coarse to fine. When tested by means of laboratory sieves, it shall meet the following requirements, in percent of total weight.

Total Retained on:

Table 18-2	
Sieve	Percent
No. 4	0 to 5
No. 8	0 to 15
No. 16	3 to 35
No. 30	30 to 75
No. 50	65 to 95
No. 80	18 to 100

18.02.04 Filter Aggregate (Other)

A) Stone

When stone is used for filter aggregate it shall be composed of clean, durable rock that is non-cementous when exposed to water for extended periods and shall be so certified by a Geotechnical/Soils Engineer. The gradations of stone filter aggregates shall be designed and certified by a Geotechnical/Soils Engineer and approved by the City Engineer. Washed limerock shall not be permitted.

B) Slag

Slag shall be clean, tough and durable. It may be either air-cooled blast-furnace slag or phosphate slag. It shall be reasonably uniform in density and quality, and the gradations of slag filter aggregates shall be designed and certified by a Geotechnical/Soils Engineer and approved by the City Engineer.

O) Expanded Shale

Expanded shale may be used, but only in the filter material grade that meets the gradations specified above for sand.

18.02.05 Pipe

Corrugated Polyethylene Tubing shall be used as underdrain and shall conform to the requirements of AASHTO M-252, latest edition. Polyethylene Tubing shall be delivered in 20 foot lengths (minimum) and shall be fitted, prior to installation, with a filter fabric wrap. PVC Pipe shall satisfy ASTM D-3033 specifications; Aluminum pipe shall satisfy AASHTO M-196 specifications.

Section 18.03 EXCAVATION TRENCH

The trench shall be excavated carefully, to such depth as is required to permit the pipe to be laid to the grade desired and to the dimensions shown in the plans.

The underdrain trench shall be constructed in a dry condition. This shall be accomplished by the use of a well point system or other positive dewatering method.

Section 18.04 PLACING THE FILTER FABRIC

After the trench has been excavated, the filter fabric shall be rolled out over the trench and walked into the trench. Care shall be taken to prevent the excavated material from entering the trench after the fabric has been installed.

Section 18.05 LAYING THE PIPE

After the filter fabric has been placed in the trench, approximately 6 inches of filter aggregate shall be placed in the trench. The pipe shall be bedded firmly in the filter aggregate to the correct line and grade. The upper end of the run of pipe shall terminate at a drainage structure or underdrain cleanout to prevent any filter aggregate from entering the pipe.

All lateral connections to underdrains shall be made at approved drainage structures. Cleanouts and/or approved drainage structures shall be located along all underdrain systems. The maximum spacing of cleanouts or structures shall be 200 feet, or as directed by the City Engineer or his Designee.

Section 18.06 PLACING AND COMPACTING FILTER AGGREGATE

After the pipe has been laid to grade, the pipe shall be firmly held in place by mechanical means while the filter aggregate is placed to a maximum height of 5 inches plus 1 inch (compacted) above the top of the pipe. After the first lift is placed and compacted to the satisfaction of the City Engineer or his Designee the remainder of the filter aggregate shall be placed. The excavation of the trench, the placement of the filter fabric, the installation of the pipe and the placement and compaction of the first lift of filter aggregate shall be accomplished in a single continuous operation. Special care shall be taken to avoid displacement or damage to the pipe or filter fabric.

Section 18.07 BACKFILL ABOVE FILTER AGGREGATE

After the filter aggregate has been placed 12 inches above the pipe the filter fabric shall be lapped the full width of the trench from both sides. The portion of the trench above the filter aggregate shall be filled with fine filter aggregate which shall be placed and tamped in layers not thicker than 12 inches to the existing grade.

Section 18.08 CERTIFICATION

The Contractor shall provide to the City Engineer or his Designee, prior to the final acceptance, a written statement from a Geotechnical/Soils Engineer that all materials installed and that the construction of the underdrain system complies with the approved design.

Section 18.09 ACCEPTANCE OF UNDERDRAINS

Prior to the acceptance for maintenance, the Owner/Developer shall correct any deficiencies. A mandrel shall be used to insure pipe geometry. Failure of the Contractor to perform the required inspection and repairs will result in the City Engineer or his Designee withholding final acceptance and/or Certificates of Occupancy.

ARTICLE 19

SIDEWALKS/BIKEPATHS, CONCRETE CURB, ETC.

Index	19.01	<u>GENERAL</u>
	19.02	<u>MATERIALS</u>
	19.03	<u>FORMS</u>
	19.04	<u>CONSTRUCTION METHODS</u>
	19.05	<u>JOINTS</u>
	19.06	<u>FINISHING</u>
	19.07	<u>CURING</u>
	19.08	<u>BACKFILLING AND COMPACTION</u>
	19.09	<u>REQUIREMENTS FOR MACHINE-LAYING</u>
	19.10	<u>HANDICAP RAMPS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	19.01	<u>GENERAL</u>
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The work specified in this ARTICLE consists of the construction of curb, curb and gutter, and sidewalks/bikepaths of Portland Cement Concrete. Such work shall be constructed in accordance with this Manual and in conformity with the lines, grades, dimensions, and notes shown on the Plans. Should the Contractor so elect, a curb machine can be used. All concrete shall be finished and supplied as recommended by the PCA and ARTICLE 14 of this Manual. Sidewalks/Bikepaths shall be located at least 2 feet away from walls and fences unless otherwise approved by the City Engineer.

Section	19.02	<u>MATERIALS</u>
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Unless otherwise shown on the Plans, concrete shall be Class I, 3,000 psi.

Section	19.03	<u>FORMS</u>
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Forms for this work shall be made of either wood or metal. They shall be straight, free from warp or bends, and of sufficient strength when staked to resist the pressure of the concrete without springing.

Forms shall have a depth equal to the plan dimensions for the depth of the concrete being deposited against them.

Section	19.04	<u>CONSTRUCTION METHODS</u>
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Excavation shall be made to the required depth. Subgrade or base shall be compacted to a minimum density of 98% of the maximum density as determined by AASHTO T-180 for sidewalks/bikepaths and curbs.

Sidewalk/bikepath construction shall be similar to street construction. Concrete sidewalks/bikepaths shall be at least 4 inches thick, increasing to at least 6 inches thick at driveway entrances. Sidewalks/bikepaths shall have a maximum longitudinal run of 12:1 and a minimum of ¼ inch, maximum of ½ inch per foot positive slope across the surface. There shall be a minimum of ½ inch and maximum of 1 inch per foot positive slope between the top of curb or edge of pavement and the sidewalk/bikepath, unless otherwise specifically approved by the City Engineer.

The concrete shall be placed in the forms to the depth specified and tamped and spaded until mortar entirely covers its surface. The top of the curb or gutter shall be floated smooth and the edges rounded to the radius shown on the plans.

Section 19.05 JOINTS

Where metal templates are used for joint construction, the curb, curb and gutter, etc., shall be constructed in uniform sections 10 feet in length, except where shorter sections are necessary for closures, but no section shall be less than 5 feet.

At the option of the Contractor, the sections may be formed by the use of dummy joints (either formed or sawed) or by the use of sheet metal templates. If sheet metal templates are used, they shall be of the dimensions and set to the lines shown on the plans. The templates shall be held firmly during the placing of the concrete and shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place. Contraction joints shall be spaced at 10 foot intervals for curb and intervals equal to the width of the sidewalks/bikepaths. They shall be ¼ the depth of the concrete. Expansion joints, extending to the full depth of concrete, shall be placed in sidewalks/bikepaths at a maximum of 100 feet, at driveways, sidewalks/bikepaths intersections, all inlets, all radius points, all points where operations cease for any considerable time (such as the end of the day's run), etc. A ½ inch expansion joint shall be installed between all curbs and any abutting structures.

Section 19.06 FINISHING

19.06.01 Surface Requirements

The gutter or flow-line section or curb shall be tested with a 10 foot straight edge laid parallel to the centerline of the roadway while the concrete is still plastic. Irregularities in excess of ¼ inch for curb, curb and gutter, or sidewalks/bikepaths shall be immediately removed.

19.06.02 Repair of Minor Defects

The forms shall be removed within 24 hours after the concrete has been placed, and minor defects then filled with mortar composed of one part Portland cement and two parts fine aggregate. Plastering shall not be permitted on the face of the curb or sidewalk/bikepath. Any rejected curb, curb and gutter, or sidewalk/bikepath shall be removed and replaced.

19.06.03 Final Finish

Sidewalk/bikepath surface, top of the curb, and the face from the top to 8 inches below shall be given a surface finish while the concrete is still green. In general, only a brush finish shall be required.

Section **19.07** **CURING**

All curbs and sidewalk/bikepath shall be covered with suitable material and kept moist for a period of 3 days or longer, if necessary, and shall be protected in a satisfactory manner from damage by the elements or other causes until acceptance of the work. If curing compound is used, moistening is not required.

Section **19.08** **BACKFILLING AND COMPACTION**

After the concrete has set sufficiently, but not later than 3 days after placing, the spaces in front and back of the curb shall be refilled to the required elevation with suitable material, which shall be placed and thoroughly compacted in layers not thicker than 6 inches.

Where bases are to be constructed adjacent to the curb, the concrete shall be properly backfilled and shall set for a period of not less than 3 days before any base material is placed against it.

Section **19.09** **REQUIREMENTS FOR MACHINE-LAYING**

As a specific requirement for machine-laid curb and gutter, contraction joints shall be sawed unless an alternate method of construction is approved in advance by the City Engineer. Joints on curbs shall be provided at intervals of 10 feet, except where shorter intervals are required for closure, but no joints shall be sawed or constructed at intervals of less than 5 feet. Sidewalks may also be machine laid.

Section **19.10** **HANDICAP RAMPS**

Ramps shall be required at all intersections and be in compliance with the most recent edition of the Florida Accessibility Code for Building Construction as prescribed by law and FDOT Standard Specifications. At each intersection there must be a sufficient number of handicap ramps to facilitate ingress and egress from both sides of the roadway. The slope of the ramp shall not exceed a ratio of 12 horizontal to 1 vertical. A curb ramp shall have a detectable warning complying with Section 11-4.29.2. The detectable warning shall extend the full width and depth of the curb ramp according to Chapter 11 Florida Accessibility Code for Building Construction.

ARTICLE 20

CHAIN LINK FENCE

Index	20.01	<u>GENERAL</u>
	20.02	<u>MATERIALS</u>
	20.03	<u>INSTALLATION</u>
	20.04	<u>ELECTRICAL GROUNDS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	20.01	<u>GENERAL</u>
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The work specified in this ARTICLE consists of furnishing and erecting chain link fence in accordance with this Manual, and Section 02444 of the Chain Link Manufacturers Institute's Specifications. The placement of any fence shall not interfere with the clear sight distance of intersections or driveways. Driveway gates shall be positioned to allow the length of one standard size vehicle behind the right-of-way line.

Section	20.02	<u>MATERIALS</u>
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	20.02.01	<u>General</u>
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The fabric, posts, fastenings, fittings and other accessories for chain link fence shall meet the requirements of AASHTO M-181 with the following changes:

- A) ANSI/ASTM A-123 - Zinc (Hot Galvanized) Coatings of Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
- B) ANSI/ASTM F-567 - Installation of Chain-Link Fence.
- C) ASTM A-120 - Black and Hot-dipped Zinc-coated (Galvanized) Welded and Seamless Steel Pipe, for Ordinary Uses.
- D) ASTM C-94 - Ready-mixed Concrete.
- E) ASTM A-120 - Schedule 40 steel or SS-40 pipe, standard weight, welded joints permitted. Size and weight as specified.
- F) FS RR-F-191 - Type I: Zinc-coated steel.
Type IV(A): Extruded vinyl coated steel.
Type IV(B): Fusion bonded vinyl coated steel.

20.02.02 Concrete Mix

Concrete shall meet ASTM C-94 and be of normal sulphate resisting Portland Cement, 3,000 psi minimum at 28 days with a 3 inch slump, and ½ inch sized aggregate.

20.02.03 Framing Materials

	<u>Framing Members</u>	<u>Type I Size/in(O.D.)</u>	<u>Round Wt/plf</u>
A)	End, Corner and Pull Posts		
	12 ft and less	2.875	5.80
	Over 12 ft	4.50	11.00
B)	Line Posts (fabric height)	2.375	3.65
C)	Rails and Braces (fabric heights)	1.660	2.27
	This includes Horizontal brace, Top Rail, Center and Bottom Rail.		
D)	Gate Posts (width of leaf)		
	6 ft and less	2.875	5.80
	Over 6 ft to 13 ft	4.50	11.0
	Over 13 ft to 18 ft	6.625	19.0
	Over 18 ft	Design to be approved and certified	
E)	Gate Frame (size of leaf)		
	8 ft high OR 8 ft wide	2.375	3.65
	Over 8 ft high OR 10 ft wide		
	Plus additional structural members	Design to be approved and certified	
	Stretcher Bars	3/16"x3/4"	
	Color coating shall be applied to match fabric		

20.02.04 Chain Link Fabric (Fences and Gates)

PVC Coated Galvanized Steel shall be of steel wire, conforming to ASTM A-641, a tensile strength 75,000 psi, galvanized (0.30 oz/sf), and coated as follows:

- A) Coating type I extruded polyvinyl chloride.
- B) Coating type II FUSION BONDED PVC of 7 mils.

The standard material shall be Standard Industrial 2 inch mesh, 9 gauge, 0.148 inch diameter, not including vinyl coating.

The color of fabric, gates, and posts shall be as approved by the City Engineer in either medium green, dark green, black, or brown, as applicable.

20.02.05 Manual Operating Gates

A) Fabrication

Gate frames shall be assembled by welding connections. The same fabric as for the fence shall be used unless otherwise specified. Fabric shall be installed with stretcher bars, or tie wires at the top and bottom if stretcher bars are not used. Stretcher bars shall be attached to the gate frame not more than 14 inches off center. Hardware shall be attached with rivets or by other means which provide security against removal or breakage.

- 1) For sections over 8 feet in height and 10 feet in width, horizontal and vertical members shall be provided to ensure proper gate operation and for attachment of fabric, hardware and accessories.
- 2) Diagonal cross-bracing consisting of 3/8 inch diameter adjustable truss rods on gates shall be used where four-sided tension rods are not used. Frame rigidity shall be achieved without sag or twist.

B) Gate hardware shall be galvanized per ASTM A-153.

- 1) Hinges shall be pressed steel or malleable iron to suit gate size, of non lift off type, and offset to permit 180° gate opening. One pair of hinges per leaf, up to 12 feet in height, shall be provided.
- 2) Latches shall be the forked type to permit operation from either side of gate. A padlock eye shall be provided as an integral part of the latch.
- 3) The keeper for the gates, which automatically engages the gate leaf and holds it in the open position until manually released, shall be provided.
- 4) For double gates, a drop rod to hold the inactive leaf shall be provided. A pipe to engage the center drop rod shall be provided in the pavement. Locking devices and padlock eyes shall be provided as an integral part of the latch thereby requiring one padlock for locking both gate leaves.

20.02.06 Accessories

- A) All items shall be galvanized to comply with ASTM A-153 (except tie wires) plus finished to match framing.
- B) Tension and tie wire
 - 1) Tension wire shall be 7 gauge galvanized wire.
 - 2) Fabric to line posts, rails and braces shall be 9 gauge minimum.
 - 3) Fabric to tension wire shall use 11 gauge hog rings.
- C) Post tops shall be pressed steel, or malleable iron, designed as a drive fit, weather tight closure cap on tubular posts. Where top rails are used, tops shall permit passage of the top rail.
- D) Stretcher bars shall be one piece lengths to full height of the fabric with a minimum cross section of $\frac{3}{16}$ inch x $\frac{3}{4}$ inch or equivalent fiberglass rod. Stretcher bars shall be provided for each gate, end, corner and pull post. Stretcher bar bands and clips shall be heavy pressed steel or malleable iron. At square posts, special design clips shall be provided.

Section **20.03** **INSTALLATION**

- A) Framework, fabric, accessories and gates shall be installed in accordance with ANSI/ASTM F-567.
- B) Fence shall be of the height and length indicated on the approved plans.
- C) Line posts intervals shall not exceed 10 feet.
- D) Terminal gate and posts shall be set plumb, in concrete footings with the top of the footing 2 inches below the finished grade. Slope top of concrete for water runoff. Excavate depth as required by ANSI/ASTM F-567.
- E) Top rail shall pass through line post tops and be spliced with 7 inch long rail sleeves.
- F) Each gate and corner post shall be braced back to the adjacent line post with horizontal center brace rails and diagonal truss rods. Brace rails shall be installed one bay from end and gate posts.
- G) Center and bottom brace rails shall be installed on corner and gate leaves.
- H) Fabric shall be stretched between terminal posts or at intervals of 100 feet maximum, whichever is less.
- I) The bottom of the fabric shall be positioned 2 inches above the finished grade.

- J) The fabric shall be fastened to the top rail, line posts, braces, and bottom tension wire with wire ties at a maximum of 15 inches on centers.
- K) The fabric shall be attached to the end, corner, and gate posts with tension bars and bar clips.
- L) The bottom tension wire shall be stretched taut between terminal posts.
- M) Gates with fabric overhang shall match fence. Three hinges per leaf, latch, catches, drop bolt, foot bolts and sockets, torsion spring retainer, and locking clamp shall be installed.
- N) Concrete center drop shall be installed to the depth of the foundation. Drop rod retainers shall be placed at the center of double gate openings.

Section 20.04 ELECTRICAL GROUNDS

Wherever a power line passes over the fence, a ground shall be installed directly below the point of crossing. The ground rod shall consist of an aluminum or galvanized rod, with connection of similar metal if required, or of other appropriate material, 8 feet in length and at least ½ inch in diameter. The rod shall be driven vertically until the top of the rod is approximately 6 inches below the ground surface. A No. 6 conductor shall be used to connect the rod and all fence elements. The conductor shall be connected to each fence element and the ground rod by means of electrical-type clamps which will prevent corrosion.

Section 20.05 DECORATIVE GATES

Where a Developer/Owner proposes decorative entry gates for a “Gated Community” for access control, all conditions required in the City’s LDC shall be met including the provisions for “Knox Box” and/or ‘opticon’ control. The Knox Box and all associated appurtenances shall be as approved by the City of Ocoee Fire Department. All automated swing gates shall be installed to provide gate swing in the direction of the vehicular flow.

ARTICLE 21

GRASSING AND MULCHING

Index	21.01	<u>GENERAL</u>
	21.02	<u>MATERIALS</u>
	21.03	<u>CONSTRUCTION METHODS</u>
	21.04	<u>SODDING</u>
	21.05	<u>CLEAN-UP</u>

[BACK TO TABLE OF CONTENTS](#)

Section	21.01	<u>GENERAL</u>
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The work specified in this ARTICLE shall consist of all grassing efforts on road shoulders, ditches, embankments, and other areas left barren by construction in order to establish a dense stand of grass.

Section	21.02	<u>MATERIALS</u>
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The grass seed shall be common Bermuda and Bahia, as a minimum. In addition, brown top millet will be included during summer months and annual rye in the winter months. The mulch shall consist of thoroughly shredded straw or hay. All seed shall meet the requirements of the State Department of Agriculture. The chemical composition of the fertilizer shall be 8-8-8 or other chemical composition specified in the plans.

Section	21.03	<u>CONSTRUCTION METHODS</u>
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Construction methods shall be in accordance with FDOT Standard Specifications.

Seed shall be applied at not less than the following rate:

Bermuda	30 lb per acre
Bahia (Argentina)	120 lb per acre
Annual Rye	20 lb per acre (October - March)
Brown-Top Millet	20 lb per acre (April - September)

Fertilizer shall be applied at the rate of 1,000 lb per acre.

Section	21.04	<u>SODDING</u>
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Sodding shall be in accordance with FDOT Standard Specifications. Sod destroyed or damaged by construction shall be replaced with the same existing type of grass in place prior to construction. All disturbed areas in the public right-of-way shall be sodded.

Section 21.05 CLEAN-UP

After each day's work, all materials shall be removed from all sidewalks and roadways used by the general public.

Section 21.06 WATERING

Watering of seed and installed sod shall be provided in accordance with FDOT Standard Specifications as a minimum. Additional watering may be required to provide an acceptable established stand of grass as directed by the City Engineer.

ARTICLE 22

PAVEMENT MARKINGS

Index	22.01 <u>GENERAL</u>
	22.02 <u>MATERIALS</u>
	22.03 <u>INSTALLATION</u>

[BACK TO TABLE OF CONTENTS](#)

Section	22.01 <u>GENERAL</u>
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The work specified in this ARTICLE shall consist of the design and installation of pavement markings as shown on the plans in accordance with this Manual, Orange County Standards as well as FDOT and the MUTCD. Temporary markings shall be used as required by the City. The City Engineer has approval jurisdiction over ARTICLE 22 and any requests for modifications from these Standards.

Section	22.02 <u>MATERIALS</u>
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All paint and Thermoplastic Compounds used for pavement markings (only alkyd materials shall be used), reflective pavement markers, and glass spheres shall conform to FDOT Standard Specifications.

Section	22.03 <u>INSTALLATION</u>
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All surfaces shall be cleaned prior to the start of installation.

22.03.01	<u>Painted Markings</u>
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Painted traffic markings shall be installed in accordance with FDOT Standard Specifications and the MUTCD. Paint may be used only on private development improvements or as temporary markings.

22.03.02	<u>Thermoplastic Traffic Markings</u>
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Thermoplastic traffic markings shall be installed in accordance with FDOT Standard Specifications and the MUTCD. Pre-formed plastic markings may be substituted as permitted by the City Engineer. Alkyd materials may be applied immediately after final compaction of asphaltic concrete.

22.03.03	<u>Reflective Pavement Markers</u>
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All reflective pavements markers shall be installed in accordance with FDOT Standard Specifications. Blue pavement reflectors shall be installed in the street, in front of fire hydrants, slightly offset from the centerline of the road in the closest lane to the hydrant.

22.03.04 Striping Design

- A) Temporary tape to be installed prior to darkness on the day of existing markings removal. No conflicting markings permitted.
- B) No markings are to be installed prior to layout approval City engineer or designer.
- C) All markings are to be thermoplastic with raised pavement markers where applicable.
- D) Centerline and edgeline to extend 15 feet beyond transition point downstream and 15 feet prior to transition point upstream.
- E) Hash marks spacing to be in accordance with FDOT Standards.
- F) Gore bullnose to have 25 foot minimum radius.
- G) Arrow spacing to conform with FDOT Standard Specifications.
- H) The City Engineer must approve all striping plans.
- I) During auxiliary lane construction and installation of markings the work zone shall be signed in accordance with the MUTCD.
- J) When a lane closure is permitted on a road classification of collector or above, the hours of operation shall be limited to 9:00 AM to 4:00 PM.
- K) Non-Standard Working hours can be requested from the City by submittal of a written request that outlines the need for the Non-Standard Working hours and the specifics of work to be performed.

ARTICLE 23

MEDIANS

Index	23.01	<u>MEDIAN SEPARATION REQUIREMENTS</u>
	23.02	<u>MINIMUM WIDTHS</u>
	23.03	<u>OPENINGS</u>
	23.04	<u>SPECIAL CONSIDERATIONS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	23.01	<u>MEDIAN SEPARATION REQUIREMENTS</u>
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At a minimum, median separations shall be required on all divided streets with four or more travel lanes. Median separations may be required in other areas when deemed appropriate . The City Engineer has approval jurisdiction over ARTICLE 23 and any request for modifications from these Standards.

Section	23.02	<u>MINIMUM WIDTHS</u>
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- A) The minimum width of a median containing a left turn lane shall be 16 feet when curbed. If the median is a bi-directional turn lane, the minimum width shall be 12 feet.
- B) The minimum width of a median intended to shadow a crossing or left turning vehicle (from side street or driveway) shall be 22 feet when curbed.

Section	23.03	<u>OPENINGS</u>
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- A) Median openings on all streets shall be spaced at 660 foot intervals or per the Standards of the LDC.
- B) Correct signal spacing and dedicated public streets are given priority consideration for median opening approvals.
- C) All median designs and provisions shall be consistent with Standards provided by the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (FDOT).
- D) All median openings and taper shall include a 12 foot wide left turn storage lane and taper. The minimum lengths for the storage lanes and tapers are included in ARTICLE 24 of this Manual.
- E) The preferred end treatment for median opening is the bullet-nose design rather than the circular design.

- F) The width of median openings shall be a minimum of 40 feet. The design shall be based upon the required turning radii and lane alignment of the intersection.
- G) No median opening shall be allowed where the median is intended to shadow a crossing or left turning vehicle (from side street or driveway), and is of insufficient width to do so.

Section 23.04 SPECIAL CONSIDERATIONS

The minimum spacing requirements of this ARTICLE may be modified upon approval by City Commission given the particular conditions of the proposed development, if the minimums cannot be met, and if such reduction will not compromise operational and safety standards of the adjacent roadway.

ARTICLE 24

TURN LANES AND TAPERS

Index	24.01	<u>GENERAL</u>
	24.02	<u>DEDICATION OF ADDITIONAL RIGHT-OF-WAY</u>
	24.03	<u>RIGHT TURN DECELERATION AND STORAGE LANES</u>
	24.04	<u>ACCELERATION LANES AND TAPERS</u>
	24.05	<u>LEFT TURN DECELERATION AND STORAGE LANES</u>
	24.06	<u>ALTERNATE STORAGE LENGTHS FOR LEFT TURN LANES</u>
	24.07	<u>BYPASS LANES</u>
	24.08	<u>EXCEPTIONS</u>
	24.09	<u>REVERSE CURVES</u>

[BACK TO TABLE OF CONTENTS](#)

Section	24.01	<u>GENERAL</u>
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Turn lanes and tapers shall be designed in accordance with this Manual and the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (FDOT) and AASHTO Green Book standards. Turn lanes and tapers shall be used to reduce conflict between the traffic on driveways or intersecting streets and the traffic on the through street. This conflict reduction is achieved by providing turning vehicles with a refuge area where acceleration, deceleration, storage, and turning maneuvers may be accomplished. The City Engineer has approval jurisdiction over ARTICLE 24 and any request for modifications from these Standards. Turn lanes and tapers are required for the following conditions:

- A) The design speed of the accessed street is 35 MPH or greater.
- B) The parcel of property accessing the street is projected to generate 500 or more vehicle trips per day, or 50 or more vehicle trips in any hour.
- C) The parcel of property accessing the street is residential and has 50 or more dwelling units.
- D) The parcel of property accessing the street is a development that characteristically experiences peaks in its trip generation pattern, i.e., schools, subdivisions, restaurants, public assembly places.
- E) At any development as a Traffic Impact Analysis by a registered professional may warrant.
- F) At any parcel of property where a use changes to one that meets one of the above conditions.

- G) The main street has an average daily traffic count of 500 or more vehicles per day or 50 or more vehicles in any hour.
- H) At any location, where grades or other unusual conditions indicate turn lanes to be desirable, as determined by the City. Turn lanes may be required on local streets at intersections for safety or capacity reasons.
- I) The street is classified as a thoroughfare.

Section 24.02 DEDICATION OF ADDITIONAL RIGHT-OF-WAY

On any arterial or collector street within a minimum of 150 feet (or as required) of its intersection with another arterial or collector, or at any other location where provisions of this Section require additional right-of-way, the right-of-way shall be increased by at least 10 feet, or as required, to permit proper design of auxiliary lanes and tapers. This additional right-of-way shall be dedicated or conveyed as a public right-of-way. Twenty-five foot corner triangles shall be provided as a minimum at street intersections. A larger triangle may be required at the discretion of the City Engineer.

Section 24.03 RIGHT TURN DECELERATION AND STORAGE LANES

The desirable requirements for lengths of tapers and storage for right turn lanes are based on the speed limit of the road and shall be in accordance with FDOT Standards.

Section 24.04 ACCELERATION LANES AND TAPERS

The desirable requirements for lengths of acceleration lane and tapers are based on the speed limit of the road and shall be in accordance with FDOT Standards.

Section 24.05 LEFT TURN DECELERATION AND STORAGE LANES

The desirable requirements for lengths of acceleration lane and tapers are based on the speed limit of the road and shall be in accordance with FDOT Standards.

Section 24.06 ALTERNATE STORAGE LENGTHS FOR LEFT TURN LANES

Storage lengths for left turn lanes may be calculated in lieu of using the above tables (final approval by the City Engineer or his Designee) by one the of following methods:

- A) At un-signalized intersections, the storage length, exclusive of taper, may be based on the number of turning vehicles which are likely to arrive in an average 2 minute period within the peak hour, i.e., $SL \text{ (storage length in feet)} = 2 \times 25 \text{ ft (average vehicle length)} \times (\text{number of left turning vehicles in peak hour}/60)$.

- B) At signalized intersections, the storage length may be based on the signal cycle length, the signal phasing arrangement, and the rate of arrivals and departures of left turning vehicles that would store per cycle to allow for occasional surges.

Section 24.07 BYPASS LANES

A bypass lane shall be provided for left turns when a median or adequate pavement width does not exist. The taper shall be based on the formula: turn lane = speed x width of lateral movement. Road sections disturbed by bypass and turn lanes shall be completely overlaid with a minimum of 1 inch of asphaltic concrete.

Section 24.08 EXCEPTIONS

Turn lane provisions (left and right) may be imposed unless roadway cross section, right-of-way width, or deficient frontage prohibits compliance and no other access location can be provided for the site. The lanes shall be installed by the Owner/Developer, in the future, when the right-of-way becomes available.

Section 24.09 REVERSE CURVES

Reverse curves shall not be used in place of straight tapers on curb and gutter sections.

ARTICLE 25

DRIVEWAYS

Index	25.01	<u>GENERAL</u>
	25.02	<u>REQUIRED SUBMITTALS</u>
	25.03	<u>DESIGN CONSIDERATIONS</u>
	25.04	<u>DESIGN SPECIFICATIONS</u>
	25.05	<u>HANDICAP RAMPS</u>
	25.06	<u>EXISTING DRIVEWAYS AND ACCESS POINTS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	25.01	<u>GENERAL</u>
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All curb cuts and driveways constructed, altered, or removed within the limits of the City of Ocoee shall be constructed, altered, or removed as provided for in this ARTICLE and the LDC. No person shall make any curb cut for a driveway, walkway or any other purpose within the street right-of-way or connect to an existing curb cut or driveway without first obtaining a permit from the City. Additional permits may be required from the County or FDOT for rights-of-way under their jurisdiction. The City Engineer has approval jurisdiction over the design, location, construction permits, materials, methods, and operational portion of this ARTICLE and any requests for modifications from these Standards.

Section	25.02	<u>REQUIRED SUBMITTALS</u>
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Information required on plans submitted shall include:

- A) A complete plot plan showing all proposed and/or existing buildings and parking layouts and shall include a north arrow, date, and dimensions.
- B) Existing and proposed driveway locations and widths on the site and within 150 feet of the site on both sides of the street and in both directions.
- C) Distances to the nearest public intersection and to the nearest median cut in both directions, if applicable.
- D) Street pavement types and widths, lane layout and widths, curb types, and right-of-way widths.
- E) Proposed and/or existing off-street loading and unloading facilities, interior parking arrangements and interior traffic circulating arrangements. (Non-residential requirement only.)
- F) Retaining walls, drainage, utility poles, trees, fences, and other physical features which affect the driveway location and sight distance.

Section 25.03 DESIGN CONSIDERATIONS

- A) The choice of the proper location of driveways must involve consideration of the amount of the conflict which can be expected to occur both within the parking area and on the abutting streets. One primary concept which shall be followed is to reduce the number of driveways to a practical minimum and to promote consolidated driveway usage wherever possible, thus providing fewer locations where conflicts may occur.
- B) The area to which the driveway provides access shall be of sufficient size and design to allow all necessary functions for ingress, egress, loading, unloading, parking, circulation, and standing to be carried out on private property completely off the street right-of-way.
 - 1) Parking areas shall be so designed and marked as to provide for orderly and safe movement and storage of vehicles and pedestrians.
 - 2) No design shall be permitted which requires any vehicle to back out onto a public right-of-way, i.e., a public street, parkway, or sidewalk, except for single family residences.
 - 3) Facilities with drive-in windows must be so designed that waiting vehicles do not extend into the street or right-of-way. A by-pass lane shall be required for all such facilities.

Section 25.04 DESIGN SPECIFICATIONS

25.04.01 Location

- A) Single family residential driveways shall not be permitted in the radius return of an intersection.
- B) No single family residential driveway, other than duplex or zero lot line, or temporary commercial driveway shall be permitted with its center nearer than 40 feet to the center of the next nearest driveway, except upon special approval of the City Engineer.
- C) No centerline of a residential driveway, other than duplex or zero lot line, driveway shall be closer to the adjacent property than $\frac{1}{2}$ of the driveway width plus 6 feet.
- D) The centerline of all other types of driveways shall be no closer to the adjoining property than $\frac{1}{2}$ the width of the driveway plus the return radius dimension and 3 feet.
- E) No driveway shall be permitted which includes any facility such as traffic signal standards, trees, utility poles, site sign, catch basins, fire hydrants, or any other similar type structure, unless such facility is relocated at the property Owner's/Developer's expense. All setbacks shall meet the FDOT requirements for fixed object hazards.

- D) No curb cut shall be made within 3 feet of a drainage inlet or property line.
- G) Joint-use driveways shall be used when deemed necessary. The above criteria shall be complied with unless otherwise approved by the City Engineer.

25.04.02 Width

- A) The minimum width of single family residential driveways shall be 10 feet and the maximum width shall be 18 feet, with 3 foot flares on either side. For driveways longer than 100 feet, the width may be increased at the discretion of the City of Ocoee Fire Rescue Department.
- B) The minimum and maximum widths of commercial driveways, are based upon 12 foot travel lanes for two-way and emergency vehicles for one-way, shall be as specified below:

<u>Table 25-1</u>		
	<u>Minimum</u>	<u>Maximum</u>
One-Way	16	20*
Two-Way	24	36*
*or as required for multi-lane driveways		

- C) Non-residential driveways exceeding the maximum width shall only be considered when usage of 40 foot radius cannot be accommodated.
- D) All driveway widths shall be measured at the throat.
- E) For all residential driveways, the width of the curb opening shall not exceed the width of the driveway by more than 3 feet on each side.

25.04.03 Angle

- A) All driveways shall be constructed as nearly to a right angle (90°) to the street or roadway as possible.
- B) This requirement may be waived for one-way driveways, provided that the angle chosen represents improved ingress or egress compared to a right angle driveway and does not adversely affect the driver's sight distance.

25.05.04 Radii

- A) On commercial and multi-family residential driveways, a proper radius which will accommodate the minimum turning radii and off-track of the design vehicle according to AASHTO Standards shall be provided. Normally, the design vehicle will be fire and emergency apparatus requiring a minimum radius of 40 feet based on a 24 foot wide two lane driveway. Consideration may be given to the street speed limit and width of driveway opening.
- B) Tractor trailer combination shall be the design vehicle, when warranted, with a 55 foot radius as a minimum on all non-single family residential driveways.
- C) A radius of less than 40 feet may be approved upon the applicant's demonstration to the City Engineer that the smaller radius is more appropriate for the particular parcel of property being served and that the traffic flow on the street being accessed is not impaired. The minimum radii for internal circulation shall be 20 feet. Three foot flares may be utilized on commercial projects where inadequate distance between the property and the road edge prohibits the use of radii, and shall be used on all non-single family residential driveways.
- D) Contraction joints shall be tied at the radii to prevent uneven settlement.

25.04.05 Grade

- A) All driveways shall cross the sidewalk/bikepath area at the sidewalk/bikepath grade as approved by the City Engineer. See the Typical City Details attached as part of this Manual.
- B) In cases where property slopes down from the street, the driveway shall be constructed in such a manner as to raise the driveway to a height equal to the top of the curb at the right-of-way line or at a more appropriate point, as determined by the City Engineer, before the down slope or up slope of the driveway begins. See the Typical City Details attached as part of this Manual.
- C) The driveway shall be designed so that approach, ramp and departure angles do not exceed the maximum as determined by the appropriate design vehicle.

Single Family Residential Driveway - Design Vehicle - Passenger Car

<u>Table 25-2</u>	
<u>Angle Type</u>	<u>Maximum Angle</u>
Approach Angle (A)	16.4°
Ramp Angle (B)	11.0°
Departure Angle (C)	10.9°

All Other Driveways - Design Vehicle - Emergency Fire Apparatus

Table 25-3	
Angle Type	Maximum Angle
Approach Angle (A)	14.14°
Ramp Angle (B)	7.26°
Departure Angle (C)	8.53°

- D) All curb cuts shall consist of a 6 inch raised or flush header curb for non-concrete approaches from the point of curvature to the point of tangency on each side of the driveway, except in locations where the accessed road is constructed with an existing swale, then a flush concrete header curb shall be provided.

25.04.05 Construction Specifications

- A) All driveways shall be constructed in conformance to the plans and specifications approved by the City Engineer.
- B) Concrete for the construction of the driveway approaches (the portion of the driveway in the right-of-way) shall be at least 3,000 psi concrete and at least 6 inches in thickness and shall utilize 6 x 6 WWF installed on proper benching. Fiber reinforced concrete mixture conforming to the standards of ASTM C1116 may be used in addition to the WWF if desired. Break and expansion joints shall be installed at the property line.
- C) Concrete for the construction of curbs shall be at least 3,000 psi concrete.
- D) Subgrade of driveways, driveway approaches, and curbs shall be compacted to a minimum density of 98% of the maximum density as determined by AASHTO T-180.

Section 25.05 HANDICAP RAMPS

Handicap ramps shall be constructed for all sidewalks/bikepaths at their intersection with a driveway. All handicap ramps shall be constructed in accordance with ARTICLE 19 of this Manual.

Section 25.06 EXISTING DRIVEWAYS AND ACCESS POINTS

- A) Existing driveways shall not be relocated, altered, or reconstructed without a permit approving the relocation, alteration, or reconstruction, and such driveway shall be subject to the provisions of this Section.
- B) When the use of any driveway is discontinued, the Owner/Developer(s) of the abutting property shall, at the Owners'/Developers' own expense, remove the driveway and replace all curbs, gutters, sidewalks/bikepaths, swales, and grass areas.

- C) When the use, building size or ownership of any property with a driveway(s) is changed, the Owner/Developer(s) of the subject property shall reconstruct the driveway in conformance with City Standards.
- D) If an existing driveway becomes a hazard to the driving or pedestrian public using the public facilities within the public right-of-way, the City Engineer may require reconstruction, relocation, or removal of said driveway. Proper notice shall be made to the property Owner as required by law.

ARTICLE 26

UTILITY LINE INSTALLATION REQUIREMENTS

Index	26.01	<u>JACK AND BORE OPERATIONS</u>
	26.02	<u>PRESSURE PIPE RESTRAINT</u>
	26.03	<u>PRESSURE CONNECTION</u>

[BACK TO TABLE OF CONTENTS](#)

Section	26.01	<u>JACK AND BORE OPERATIONS</u>
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26.01.01	<u>General</u>
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The installation of a casing pipe by the method of jacking and boring shall be covered by these Specifications. The overall work scope shall include, but not be limited to, jacking and boring pits and equipment, sheeting, steel casing pipe, skids, steel straps, coatings, location signs as required, miscellaneous appurtenances, and restoration to complete the entire work as specified in the Typical City Details attached as part of this Manual. Jack and bore operations shall be performed within the right-of-way and/or easements shown on the Drawings.

26.01.02	<u>Pipe Material</u>
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A) Steel Casing

Steel casings shall conform to the requirements of ASTM A-139 (straight seam pipe only) Grade "B" with a minimum yield strength of 35,000 psi. The casing pipes shall have the minimum nominal diameter and wall thickness as shown on the following table:

Table 26-1		
<u>Carrier Pipe Nominal Diameter</u>	<u>Casing Outside Diameter</u>	<u>Casing Wall Thickness</u>
4"	14"	.250"
6"	16"	.250"
8"	18"	.250"
10"	20"	.250"
12"	24"	.250"
16"	28"	.312"
18"	30"	.312"
20"	34"	.375"
24"	36"	.375"

Field and shop welds of the casing pipes shall conform with the American Welding Society (AWS) standard Specifications. Field welds shall be complete penetration, single-bevel groove type joints. Welds shall be airtight and continuous over the entire circumference of the pipe and shall not increase the outside pipe diameter by more than $\frac{3}{4}$ inch.

B) Carrier Pipe

The carrier pipe shall be minimum pipe as described in sequential ARTICLES per the appropriate application with all joints restrained. Ductile iron pipe shall comply with the specification outlined in this Manual.

26.01.03 Inspection

All casing pipe to be installed may be inspected at the site of manufacture for compliance with these Specifications by an independent laboratory selected and paid for by the City. The manufacturer's cooperation shall be required in these inspections.

All casing pipe shall be subjected to a careful inspection prior to being installed. If the pipe fails to meet the Specifications it shall be removed and replaced with a satisfactory replacement at no additional expense to the City.

26.01.04 Other Jurisdictions

For casing pipe crossings under roadways, railroads, or other installations not within the jurisdiction of the City, the Contractor shall comply with the regulations of said authority in regard to design, specifications and construction.

26.01.05 Workmanship

- A) The jack and bore operations shall be done simultaneously with continuous installation until the casing pipe is in final position. Correct line and grade shall be carefully maintained. Add-on sections of casing pipe shall be full-ring welded to the preceding length, development water-tight total pipe strength joints. The casing installation shall produce no upheaval, settlement, cracking, movement or distortion of the existing roadbed or other facilities. Following placement of the carrier pipe within the steel casing, masonry plugs are to be installed at each open end. Casing pipe and welds shall be asphaltic coated using Koppers 300M or equal with a minimum final dry thickness of 20 mils.
- B) Casing pipe holes shall be mechanically bored through the soil by a cutting head on a continuous auger mounted inside the pipe. The auger shall extend a minimum distance beyond the end of the pipe casing to preclude formation of voids outside of the pipe shell.
- C) Required jacking and boring pits or shafts shall be excavated and maintained to the minimum dimension. Said excavations shall be adequately barricaded, sheeted, braced and dewatered as required.

26.01.06 Pipe Handling

Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe shall not be dropped. All pipe shall be examined before laying, and no piece shall be installed which is found to be defective. Any damage to the pipe or coatings shall be repaired to the satisfaction of the City.

26.01.07 Work Coordination

It shall be the Contractor's responsibility to perform the jack and bore work in strict conformance with the requirements of the agency in whose right-of-way or easement the work is being performed. Any special requirements of the agency, such as insurance, flagmen, etc., shall be strictly adhered to during the performance of work. The special requirements shall be performed by the Contractor at no additional cost to the City.

26.01.08 Dewatering

Dewatering through the casing during construction shall not be permitted. All dewatering methods shall be approved by the City before construction work begins.

26.01.09 Carrier Pipe Support

The carrier pipes shall be supported within the casing pipes so that the pipe bells do not rest directly on the casing. The load of the carrier pipes shall be distributed along the casing by casing spacers. Casing spacers shall be bolt on style split shells made of either T-304 stainless steel or fusion coated steel (a minimum 0.010 inch thick coating of PVC shall be provided over the entire band). The shell shall be lined with a PVC liner 0.090 inch thick with 85-90 Durometer. All nuts and bolts shall be high strength, low alloy meeting AWWA C-III. Runners shall be made of a high molecular weight polymer with inherent high abrasion resistance and a low coefficient of friction.

26.01.10 Jacking Pits

Excavation adjacent to the roads shall be performed in a manner to adequately support the roads. Bracing, shoring, sheeting or other supports shall be installed as needed. Contractor shall install suitable reaction blocks for the jacks as required. Jacking operations shall be continuous and precautions shall be taken to avoid interruptions which might cause the casing to "freeze" in place. Upon completion of jacking operations, the reaction blocks, braces, and all other associated construction materials shall be completely removed from the site.

Adjust to the roads creating a drop-off hazard as described in the FDOT PPM or Greenbook – Jacking Pits shall be adequately protected meeting FDOT standards.

26.01.11 Miscellaneous Requirements

Correct line and grade shall be carefully maintained. Earth within the casing shall not be removed too close to the cutting edge in order to prevent the formation of voids outside the casing. If voids are formed, they shall be satisfactorily filled with grout by pumping.

The sections of steel casing shall be field welded in accordance with the applicable portions of AWWA C-206 and AWS D-7.0 for field welded pipe joints. Contractor shall wire brush the welded joints and paint with a primer. After completion of jacking, Contractor shall clean the interior of the casing of all excess material. Refer to Approved Manufacturer's List for acceptable products.

The annular space between the carrier pipe and casing shall be filled with clean sand, if required. Masonry plugs are to be installed at each open end of the casing. Plugs shall be suitable for restraining the earth load while allowing drainage of the casing.

Section **26.02** **PRESSURE PIPE RESTRAINT**

26.02.01 General

Pressure pipe fittings and other items requiring restraint shall be braced with restraining assemblies as specified in this Manual.

All pressure pipe and fittings shall be restrained as specified in this Manual, preventing movement of lines under pressure at bends, tees, caps, valves, hydrants etc. Use of thrust blocks for pressure pipe and fittings 16 inches and larger shall not be allowed. Ductile iron pressure pipe and fittings 12 inches and smaller may be restrained following the criteria established in this Manual.

26.02.02 Thrust Block Construction

Thrust blocks shall not be typical and shall only be used when the City Engineer deems it a hardship or good engineering standards deem it necessary because restraining assemblies are impractical or insufficient. If thrust blocks are used, a thrust block table meeting City standards shall be provided by the Design Engineer. Where undisturbed trench walls are not available for thrust blocking, the Contractor shall furnish additional concrete or install suitable pipe harnesses or ties designed and manufactured specifically for this purpose. Additional concrete, harnesses and/or ties shall be approved by the Engineer and the City. Fittings shall be protected by polyethylene film, minimum 8 mil thick, prior to placing concrete for thrust block.

Concrete for thrust blocking shall have a minimum compressive strength of 3,000 psi. Concrete shall be placed against undisturbed material and shall not cover joints, bolts or nuts, or interfere with the removal of any joint. Wooden side forms shall be provided for thrust blocks where trench conditions require. Thrust blocks shall be properly set and adequately cured prior to pressurizing the system.

26.02.03 Restrained Joint Construction

Sections of piping requiring restrained joints shall be constructed using pipe and fittings with restrained “Locked-type” joints manufactured by the pipe and fitting manufacturer and the joints shall be capable of holding against withdrawal for line pressures 50% above the normal working pressure. Mechanical joint ductile iron pipe retainer glands shall not be permitted. Any restrained joints that allow for elongation upon pressurization will not be allowed in those locations where the pipe comes out of the ground.

The minimum number of restrained joints required for resisting forces at fittings and changes in direction of pipe shall be determined from the length of restrained pipe on each side of fittings and changes in direction necessary to develop adequate resisting friction with the soil.

The required lengths of restrained joint ductile iron pipe shall be determined by the Engineer and shown in a tabular form as depicted on the “Restrained Pipe Table” in the Typical City Details attached as part of this Manual. All calculations shall be based on the method outlined in the publication entitled “Thrust Restraint Design for Ductile Iron Pipe”, latest edition (DIPRA).

Wherever two 45° bends are used in place of a 90° bend and the minimum restrained joints required from one 45° bend extend beyond the other 45° bend, the two 45° bends will be considered as though a 90° bend were located midway between the two 45° bends.

26.02.04 Mechanical Restraining Devices

Mechanical restraining devices as specified herein may be substituted for the restrained “Locked-Type” joints manufactured by the ductile iron pipe and fitting manufacturer. The required lengths of restrained joint ductile iron pipe shall be determined by the Engineer and shown in a tabular form as depicted on the “Restrained Pipe Table” in the Typical City Details attached as part of this Manual.

Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A-536. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI A-21.11 and ANSI/AWWA C-153/A-21.53. Twist-off nuts shall be used to insure proper actuating of the restraining devices.

The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2 to 1.

Section 26.03 PRESSURE CONNECTION

26.03.01 General

Installations of pressure connections 4 inches and larger shall be made in accordance with this Section.

26.03.02 Tapping Sleeves

Tapping sleeves shall be mechanical joint sleeves or fabricated steel sleeves as specified below. All pressure connections to asbestos cement pipe and all “size on size” taps shall utilize full body mechanical joint sleeves.

A) Mechanical Joint Sleeves

Sleeves shall be cast of gray-iron or ductile-iron and have an outlet flange with the dimensions of the Class 125 flanges shown in ANSI B-16.1 properly recessed for tapping valve. Glands shall be gray-iron or ductile iron. Gaskets shall be vulcanized natural or synthetic rubber. Bolts and nuts shall comply with ANSI/AWWA C-III/A-21.11. Sleeves shall be capable of withstanding a 200 psi working pressure.

B) Steel Tapping Sleeves

Sleeves shall be fabricated of stainless steel. Outlet flange shall meet AWWA C-207, Class “D” ANSI 150 lb drilling and be properly recessed for the tapping valve. Bolts and nuts shall be high strength low alloy steel to AWWA C-III (ANSI A-21.11). Gasket shall be a full circumferential gasket be vulcanized natural or synthetic rubber.

26.03.03 Tapping Valves

Tapping valves shall meet the requirements of this Manual except that units shall be flange by mechanical joint ends. Valves shall be compatible with tapping sleeves as specified above and specifically designed for pressure connection operations.

26.03.04 Notification and Connection to Existing Mains

All connections to existing mains shall be made by the Contractor only after the connection procedure and work scheduling has been reviewed and approved by the City. The Contractor shall submit a written request to the City a minimum of 5 working days prior to scheduling said connections. In this request, the Contractor shall outline the following:

A) Points of Connection, fittings to be used, and method of flushing and disinfection if applicable.

B) Estimated construction time for said connections.

All connections shall be made only on the agreed upon date and time. If the Contractor does not initiate and complete the connection work in the agreed upon manner, the Contractor shall be required to reschedule the said connection by following the procedure outlined above. The Contractor shall not operate any valves in the system.

26.03.05 Construction Details

Sufficient length of main shall be exposed to allow for installation of the tapping sleeve and valve and the operation of the tapping machinery. The main shall be supported on concrete pedestals or bedding rock at sufficient intervals to properly carry its own weight, plus the weight of the tapping sleeve, valve and machinery. Any damage to the main due to improper or insufficient supports shall be repaired at the Contractor's expense. Adequate restrained joint fittings shall be provided on the existing main as well as the new main to prevent movement of the installation when test pressure is applied. Provisions of this Manual shall apply.

The inside of the tapping sleeve and valve, the outside of the main, and the tapping machine shall be cleaned and swabbed or sprayed with 10% liquid chlorine prior to beginning installation for water system pressure connections. After the tapping sleeve has been mounted on the main, the tapping valve shall be bolted to the outlet flange, making a pressure tight connection. Prior to beginning the tapping operation, the sleeve and valve shall be pressure tested at 150 psi to ensure that no leakage will occur.

For pressure connections through 12 inch diameter or less the minimum diameter cut shall be ½ inch less than the nominal diameter of the pipe to be attached. For 14 inch through 20 inch installations the minimum diameter shall be 1½ inches less; for larger taps the allowable minimum diameter shall be 2 to 3 inches less than the nominal diameter of the pipe being attached. After the tapping procedure is complete the Contractor shall submit the coupon to the City.

For pressure connections to wastewater force mains the tapping valve shall be placed horizontally. After the tapping procedure is complete a plug valve shall be attached to the tapping valve. The tapping valve shall be left in the open position prior to backfilling.

ARTICLE 27

WASTEWATER FACILITIES DESIGN

Index	27.01	<u>GENERAL</u>
	27.02	<u>DESIGN STANDARDS</u>
	27.03	<u>MANHOLES</u>
	27.04	<u>SERVICE CONNECTIONS</u>
	27.05	<u>LINE LOCATIONS</u>
	27.06	<u>GREASE TRAPS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	27.01	<u>GENERAL</u>
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The following design criteria shall pertain to the general requirements of all sanitary manholes, gravity sanitary sewers, lift stations, and force mains. Additionally, the Water Environmental Federation (WEF), Manual of Practice No. 9, entitled “Design and Construction of Sanitary and Storm Sewers”, latest edition, may generally be used as a design guide, if not in conflict with State, local, or other regulatory agency requirements or with any material presented herein.

27.01.01 Type of Sewers

The City will approve Plans for new sewer systems and extensions only when designed as separate systems in which precipitation, runoff and groundwater are excluded.

27.01.02 Design Period

Sewer systems shall be designed for the estimated ultimate tributary population as derived for the City’s approved future land uses or as delineated in the approved City of Ocoee Wastewater Master Plan, latest edition, except when considering parts of the systems that can be readily increased in capacity.

27.01.03 Location

Gravity sewers shall be located in dedicated rights-of-way or utility easements. Whenever possible, sewers shall be located under pavement in dedicated rights-of-way. All sewers located outside of dedicated rights-of-way shall require a minimum 20’ easement. If a gravity sewer is located adjacent to a road right-of-way, a minimum 10’ easement shall be provided. Additional easement widths shall be provided if the pipe size or depth of cover so dictate. No gravity sewers shall be placed under retention ponds, tennis courts, or other structures. In general, gravity sewers shall not be located alongside of rear lot lines. Placement of a gravity sewer alongside a rear lot line may be allowed on a case-by-case basis if such a sewer configuration results in efficient placement and utilization of the sewer system. These criteria shall also apply to sewer placement in retention pond berms. In any event, no manholes shall be placed alongside of rear lot lines.

27.01.04 Design Calculations

Design Engineer shall submit signed, sealed and dated design calculations with the plans for all sewer projects. Calculations shall show that sewers will have sufficient hydraulic capacity to transport all design flows. In lieu of calculation, the Design Engineer may submit design computer model and associated information including inputs, assumption, model run result(s) that indicate system is designed to comply with City requirements and signed and sealed design report. Model shall be integrated into City model for simulations.

Section 27.02 DESIGN STANDARDS

Sanitary sewer force mains and gravity design shall specifically be in accordance with ARTICLE 28 and ARTICLE 29 of this Manual.

27.02.01 Average Daily Flow (ADF)

The average daily flow is the standard base reference in the design of all wastewater systems. It represents the annual average daily flow of wastewater generation. All service area generators such as domestic, commercial, institutional, and industrial shall be included in the determination of the total average daily flow. Either per capita unit flows, fixture unit methods, and/or historical flows shall be used by the designer in determining the ultimate project flow in accordance with those rates currently in effect and available at the City of Ocoee.

27.02.02 Peak Flow

The peak flow is used in the design of all wastewater systems. It is the product of a peaking factor and the average daily flow. The peaking factor is a ratio of the average daily flow and the peak discharge, occurring during the maximum daily flow of the year. The selection of the peaking factor is based upon the following table for flows (ADF) up to 3.0 MGD. Peaking factors for flows with larger average daily flows will be evaluated by the Engineer on an individual basis.

<u>Table 27-1</u>	
<u>Flow Range</u> (MGD-ADF)	<u>Peaking Factors</u> (PF)
0.000-0.100	4.0
0.101-0.300	3.5
0.301-0.900	3.0
0.901-3.000	2.5

Section **27.03** **MANHOLES**

27.03.01 General

Manholes shall be in accordance with ARTICLE 17 and per the latest revision of the City's Typical City Details. Manholes shall be precast concrete with integral slab and lower ring, or be poured-in-place concrete slab with precast ring wall, or be of all fiberglass construction meeting ASTM D-3753 standards.

27.03.02 Location

Manholes shall be installed at the end of each gravity sewer; at all changes in grade, size or alignment; at all sewer intersections; and at distances not greater than 400 feet. When Private sewer systems must be separated from the City sewer system, a manhole shall be required at change of ownership.

27.03.03 Manhole Base

Bottom slabs for fiberglass and poured-in-place manholes shall be a minimum of 8" thick and reinforced with No. 4 bars at 9" on centers. Precast manholes shall be in accordance with FDOT Standard Specifications. All bases shall have proper lifting hooks in the bottom slabs (minimum of 3). There shall be no penetrating lifting holes on any structures, and no holes shall be allowed within 6" of any joint on structures.

27.03.04 Rings and Covers

See Article 16 Section 16.11 for more rings and covers details

27.03.05 Top Elevation

Precast manhole tops shall be adjustable between 6" and 12" by means of solid clay bricks or precast grade rings laid in mortar. Vertical walls of manhole entrances shall not exceed 18" in length, including the ring and cover.

27.03.06 Coating

Typical coating for concrete sanitary manholes shall be coated, at a minimum, with coal tar epoxy. All manholes with drop connections, force main connections, receiving manholes and large manholes shall be coated with spray on Green MonsterTM Liner at a 90 to 110 mil thickness or approved equal. This work shall be accomplished prior to TV inspection.

27.03.07 Joint Sealer

A pre-formed plastic joint sealer shall be required. All exterior joints shall be sealed with approved rapid seal tape with a minimum of 8" width.

27.03.08 Connections to Manholes

Connections shall be as specified in the Typical City Details attached as part of this Manual. Connections shall be made with a wall penetration boot. The specific manufacturer and model are as listed in the approved materials list. Space between boot and pipe OD shall be filled with appropriately sized cavity O-ring. Clay pipe shall have a short nipple (18" or 24") between the manhole fitting and the first full length of pipe. All openings for pipes into existing structures shall be made by cutting with a power driven circular coring machine.

27.03.09 Non-Shrink Mortar

All holes in manholes and wet wells shall be thoroughly plugged with an approved non-shrinking mortar, applied and cured in strict conformance with the manufacturer's recommendations. The mortar shall be finished smooth and flush with the adjoining interior and exterior manhole and wet well wall surfaces. When mortar is set, coat with an approved coating as listed in the approved materials list.

27.03.10 Stubs and Stoppers

Pipe stoppers shall be installed in all manhole stubs. When connecting to an existing stub and prior to removing the existing stopper, brick the inside opening to prevent any flow until the new system has been tested and cleaned. The brick shall not be removed until the final inspection.

27.03.11 Bulkheading Stub Channels

The downstream end of all outlets in the manholes of sub-out-channels not in use shall be bulkheaded to prevent the creation of a septic condition resulting from ponding of sewage or debris.

Section **27.04 SERVICE CONNECTIONS**

27.04.01 General

Service connections connecting the gravity sewer to the house or establishment being served, shall be through a lateral and miscellaneous appurtenances, all as specified in the Typical City Details attached as part of this Manual.

27.04.02 Size and Length

Service laterals and fittings shall be a minimum of 6" in diameter and shall be less than 100' in length.

27.04.03 Slope

Service laterals shall have a minimum slope of 1%.

27.04.04 Connection

In general, service laterals shall not be allowed to discharge into sanitary manholes, except at terminal manholes. A case-by-case exception to this requirement may be allowed if the lateral discharges at the same elevation as the manhole invert.

Section 27.05 LINE LOCATIONS

- A) Mains shall be installed in the center of paved right-of-way on new construction.
- B) Where sewers are to be installed in existing paved areas, mains may be installed in unpaved portions of the right-of-way. All utility lines to be dedicated to the public, located outside of dedicated rights-of-way, shall require a minimum 20' easement. If a utility line to be dedicated to the public is located adjacent to a road right-of-way, a minimum 10' easement shall be provided. Additional easement widths shall be provided if the pipe size or depth of cover so dictates.
- C) Mains shall not be allowed inside of back lot easements unless approved by the Engineering Department prior to construction.
- D) Mains shall not be installed beneath canals, retention areas, or swales without prior approval of the Engineering Department. Any lines in these areas must be installed within a pipe casing that extends the full length of the body being crossed.

ARTICLE 28

GRAVITY SANITARY SEWERS

Index	28.01	<u>GENERAL</u>
	28.02	<u>DESIGN CRITERIA</u>
	28.03	<u>MATERIALS</u>
	28.04	<u>INSTALLATION</u>
	28.05	<u>CONNECTIONS</u>
	28.06	<u>TESTING</u>
	28.07	<u>TESTING PRIOR TO RESURFACING</u>
	28.08	<u>FINAL INSPECTION</u>
	28.09	<u>GREASE INTERCEPTORS</u>
	28.10	<u>IDENTIFICATION</u>

[BACK TO TABLE OF CONTENTS](#)

Section	28.01	<u>GENERAL</u>
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This ARTICLE shall govern the design and construction of gravity sewer mains, service laterals, manholes, stoppers, and other appurtenances.

Pipe used in gravity sewer construction shall be polyvinyl chloride (PVC) or ductile iron pipe with an approved interior coating/lining (DIP). Alternate pipe material use may be allowed if prior approval is obtained from the City Engineer. Where reference is made to an ASTM, ANSI or AASHTO designation, it shall be the latest revision.

The Contractor shall be responsible for all materials furnished and storage of same until the date of substantial completion. At the Contractor's expense, all materials found to be defective or damaged in handling or storage shall be replaced. The Contractor shall, if requested by the City, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated Specifications.

Section	28.02	<u>DESIGN CRITERIA</u>
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- A) Design Flow: Sewers of 15" in diameter and less shall be designed to not exceed $\frac{1}{2}$ pipe depth full at peak design flow. Sewers greater than 15" shall be designed to not exceed $\frac{3}{4}$ pipe depth full at peak design flow.
- B) Minimum diameter
 - 1) Main Sewer - 8 inches.
 - 2) Single lateral - 6 inches.
 - 3) Commercial user lateral - 6 inches.
 - 4) Multi-Family user lateral - 6 inches.

C) Velocity in pipes

- 1) Minimum - 2 feet per second. (At the design flow)
- 2) Maximum - 7 feet per second.

D) Minimum Cover

The minimum cover over gravity sewers shall be no less than 3 feet, calculated from the finished grade. Exceptions to this requirement may be made for a short length of pipe where structural considerations are incorporated in the design.

E) Roughness Coefficient: For Manning's formula use an "n" value of 0.012 for PVC and 0.013 for other pipe materials.

F) Minimum Slope versus Pipe Diameter

<u>Table 28-1</u>		
<u>Minimum Slope in Foot Per 100 Feet</u>		
<u>Sewer Size</u>	<u>PVC</u>	<u>Other Material</u>
8"	0.30	0.33
10"	0.21	0.25
12"	0.17	0.19
15"	0.12	0.15
18"	0.10	0.11
21"	0.08	0.09
24"	0.07	0.08
27"	0.06	0.07
30"	0.05	0.06
36"	0.04	0.04

Slopes slightly less than those required for the velocity of 2.0 feet per second may be permitted under special conditions, when pipe is flowing full, if detailed justifiable reasons are given. Such decreased slopes shall only be considered where the depth of flow will be 0.3 of the diameter or greater for design average flow. Whenever such decreased slopes are selected, the Developer's Engineer must furnish computations of the depths of flow in such pipes at minimum, average, and peak rates of flow.

Sewers shall be laid with uniform slope between manholes.

G) Size and Alignments

Size conversion between manholes shall not be allowed. All sewers shall be laid with straight alignments between manholes.

H) Additional Requirements

Main drain and back wash systems for pools, spas and storm drain systems shall not connect to the gravity sewer system.

In general, all sewer extensions for future connections shall terminate at a manhole. The City may allow such extensions without a terminal manhole on a case-by-case basis subject to all of the following conditions:

- A) Total sewer extension length shall be limited to 50 feet.
- B) Sewer extension location at the initiating manhole shall be plugged to the satisfaction of the City.
- C) Such sewer extensions shall not be a part of the accepted sewer facilities. This shall be clearly delineated on the plans.
- D) All such sewer extensions shall be inspected and accepted as part of the future construction phase.

Section 28.03 MATERIALS

28.03.01 PVC Gravity Sewer Pipe

PVC Gravity Sewer Pipe (4" to 15"), ASTM D-3034, SDR 35. Uniform minimum "pipe stiffness" at 5% deflection shall be 46 psi. When the average depth of cover of the gravity sewer pipe is 12' or greater, SDR 26 PVC pipe shall be installed. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D-3212 and ASTM F-477. Applicable UNI-Bell Plastic Pipe Association standard is UNI-B-4.

PVC Gravity Sewer Pipe (18" to 27"), ASTM F-679, SDR 35. Uniform minimum "pipe stiffness" at 5% deflection shall be 46 psi. When the average depth of cover of the gravity sewer pipe is 12' or greater, SDR 26 PVC pipe shall be installed. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D-3212 and ASTM F-477. Applicable UNI-Bell Plastic Pipe Association standard is UNI-B-7.

All PVC pipe shall bear the NSF-DW seal. The minimum standard length of pipe shall be 13 feet.

28.03.02 DIP Gravity Sewer Pipe

The use of Ductile Iron Pipe (DIP) shall be limited to specific uses and shall be approved by the City Engineer. DIP shall conform to ANSI/AWWA A-21.51/C-151, class thickness designed per ANSI/AWWA A-21.50/C-150, with mechanical or push-on joints. An interior protective lining of Protecto 401 shall be provided with a minimum dry thickness of 40 mils or equivalent. DIP gravity sewers, where called for by the City, shall be wrapped with polyethylene film, AWWA C-105. (See approved Manufacturer's List attached as part of this Manual.) The minimum standard length of pipe shall be 18 feet.

28.03.03 Coatings and Linings (Iron Pipe)

All ductile iron pipe and fittings shall have an interior protective coating of Protecto 401 in accordance with the manufacturers recommendations. Interior coating shall be holiday free and holiday tested in accordance with ASTM G-62 and ASTM D5162.

Polyethylene Encasement, where required, shall be per ANSI A-21.5 (AWWA C-105). If Exterior polyethylene encasement is not required, the pipe exterior shall be bituminous coated.

28.03.04 Non-Shrink Mortar

All holes in manholes and wet wells shall be thoroughly plugged with an approved non-shrinking mortar, applied and cured in strict conformance with the manufacturer's recommendations. The mortar shall be finished smooth and flush with the adjoining interior and exterior manhole and wet well wall surfaces. When mortar is set coat with an approved coating material. For manholes and wet wells with sprayed on liners, treatment of exposed mortar shall follow manufacturer's recommendations.

28.03.05 Sanitary Manholes

Sanitary manholes shall be in accordance with ARTICLES 17 and 27 of this Manual.

Section **28.04** **INSTALLATION**

28.04.01 General

Trench excavating and backfill including sheeting and bracing, dewatering, bedding and foundation, and furnishing and disposal of materials shall be performed in such a manner as to promote the safe and expedient execution of the work and in all cases shall conform to the requirements of OSHA CFR 1926 Subpart P for trench safety.

28.04.02 Pipeline Trenching

- A) Excavation of trenches shall not advance more than 50 feet ahead of completed pipe installation, except as approved by the City Engineer or his Designee.
- B) Excavation in close proximity to existing utilities shall be performed in a manner to prevent damage. Representatives of utilities shall be contacted for assistance in locating buried lines.
- C) All excavations should be made by open cut **unless otherwise indicated in this Manual**. See the Typical City Details attached as part of this Manual.

28.04.03 Sheeting, Shoring, and Bracing

Furnish, install, and maintain sheeting, bracing, and shoring support required to keep excavations within the easement or right-of-way, to support the sides of the excavation, and to prevent any movement which may damage adjacent pavements or structures, damage or delay the work, or endanger life and health. Voids outside the supports shall be immediately filled and compacted. Sheeting, bracing, and shoring to be used shall be designed by a Florida Registered Professional Engineer.

28.04.04 Dewatering and Drainage

At all times during construction keep excavations free from standing water. Sumps, if required, shall be located outside of load bearing areas so the bearing surfaces will not be disturbed. Water pumped from the excavation shall be discharged to prevent re-entry into the soil strata being dewatered. Water containing material such as silt in suspension or solids shall not be pumped into sewer lines or adjacent streams. The method of disposing of water pumped from the excavation shall be approved by the City Engineer or his Designee prior to actual disposal. Dewatering discharges shall comply with all Regulatory Agency Requirements.

28.04.05 Stabilization

If portions of the bottom of trenches or excavations consist of material unstable to such a degree that, in the opinion of the City Engineer, it cannot adequately support the pipe or structure, the bottom of the trench or excavation shall be over-excavated and stabilized with approved coarse granular stabilization material. Depth of stabilization shall be sufficient to provide unyielding Surface or a min thickness of 6 as directed by the City Engineer or his Designee.

28.04.06 Bedding of Piping

A) General

- 1) Haunching is defined as the shaped and tamped granular material which extends from the pipe bedding to the spring line of the pipe. Cover is defined as the compacted material which protects and covers piping, and which extends from the top of haunching material to a point 1' above the top of the pipe. Backfill, as specified hereafter, is defined as the material extending above the top of pipe cover to topsoil, paving subgrade, or foundation level.
- 2) All buried piping shall be continuously bedded and covered, except where concrete encasement, concrete cradles, or jack and bore are indicated.

B) Pipe Bedding

Any part of the trench bottom that is excavated below the pipe grade shall be backfilled to grade with a minimum of 6 inches of granular material and compacted as required in Section 26.04.07. Bedding materials shall be limited to Class I or Class II materials.

C) Pipe Cover

All cover materials shall be clean fill with no debris and carefully deposited to avoid damage to the pipe and shall be compacted as specified hereafter.

28.04.07 Trench Backfilling

Backfill shall be granular material or suitable previously excavated pipe trench material approved for use by the City Engineer. The granular backfill shall be carefully deposited in uniform lifts as specified below and each lift shall be wetted adequately as needed to obtain the required compaction density with vibratory compactors, as specified hereafter.

Unless otherwise indicated or approved by the City Engineer or his Designee, fills shall be placed in the loose lift thicknesses indicated hereafter and compact to a dry density, not less than the following percentage of maximum dry density, determined by the Modified Proctor Test, ASTM D-1557, unless otherwise noted.

28.04.08 Pipe Laying and Jointing

Gravity sewers shall be laid in the dry to the elevations and slopes shown on the approved construction drawings. Laser equipment shall be used to provide line and grade. Surveying equipment shall be used to set the laser. The laser equipment shall have a slope indicator to facilitate checking by both the pipe-laying foreman and the City Engineer. Since most gravity sewers are laid with extremely flat slopes, zero tolerance for errors in line and grade will be allowed. Upon completion of the work, the lines shall be cleaned, with all debris removed at downstream manhole. Each section of pipe shall be TV inspected to indicate any pipe defects such as bellies or other deformities, and, if necessary, shall be taken up and re-laid to provide the correct line and grade. Special attention shall be given to the requirement that the pipe be laid in a dry trench with properly compacted bedding and backfill. The pipe shall be laid with the spigot ends pointing in the direction of flow, starting at the lowest point. Joint contact surfaces shall be cleaned immediately prior to jointing. Lubricants, primers, or adhesives shall be used as recommended by the joint manufacturer. The minimum allowable cover for gravity sewers shall be 3 feet from the top of the pipe to the finished grade. However, should this depth not be feasible, where grade depressions along the alignment are unavoidable, ductile iron pipe shall be provided within the limits of the lesser cover. In no case shall the pipe cover be less than 18 inches, and any deviations from 3 feet of cover shall be approved in writing by the City Engineer. Pipes shall be installed to the alignment and grade as shown on the approved plans.

28.04.09 Branches

Wye branches are to be installed in conjunction with the laying of sewer pipe. Wyes to serve all existing and future dwelling units shall be installed. The longitudinal barrel of branch fittings shall conform to the line and grade, diameter, and quality of the sewer main. All service laterals shall be perpendicular to the longitudinal axis of the pipe.

28.04.10 Laterals

Laterals shall be extended to and located between 3 and 4 feet below the right-of-way line's finished grade, with a 6" clean out as near to right-of-way line as permitted. No double service laterals allowed for single or duplex homes. Laterals shall run in the most direct route and perpendicular to the sewer main at a minimum grade of 1% from the main to the right-of-way line. A wye branch fitting for each service line shall be provided. Double wyes are not acceptable. All laterals and service wyes at the last joint shall be plugged and securely sealed to withstand the internal pressure of leakage or air pressure testing. The plug shall be capable of removal without injury to the socket. An S shall be saw cut and painted green in the top of the curb directly over the lateral location. If curbing is not part of the work, a 4" x 4" x 3' wooden stake shall be painted green and installed at the end of the connection. Clean-out caps shall be of the inverted hex-nut type. If required by the City Engineer or his Designee, the terminal ends of laterals shall be marked by electronic location devices that are compatible with City owned equipment. Cleanouts shall not be permitted in driveways.

28.04.11 Protection of Water System Crossings

1. Separation of Water Mains and Sewers:

- A. Separation of potable water, reclaimed water, storm and sewer systems shall comply with FDEP regulations and STANDARD DRAWINGS
- B. Water pipes shall not pass through any part of a storm sewer or manhole. A three-foot minimum separation from storm water structures shall be maintained to facilitate maintenance and operation.

2. Compliance with F.A.C.Rule 62-555.314 shall be met as a minimum.

3. If required by the City Engineer, cathodic protection shall be provided.

28.04.12 Downstream Protection

Dirt and debris collected in the pipe during construction shall not be flushed downstream. The open end of pipe shall be closed daily to prevent foreign matter from entering.

Section 28.05 CONNECTIONS

28.05.01 Transition Connections

Where pipes of alternate materials (VC to CI, etc.) are to be connected between manholes, suitable approved transition couplings shall be installed. Specially designed units may be submitted for approval. Concrete collars are not acceptable.

28.05.02 Connections to Existing Lines

A collar wye saddle for 4 inch and 6 inch diameter connections to existing sewer lines shall be used. The existing line shall be cut using a template to accomplish a true and clean opening for the saddle. Gasketed saddles with stainless steel straps shall be used, where available from the manufacturer. The sewer main shall be protected and cleaned of debris.

28.05.03 Tall Riser Connections

Connections shall be provided, as specified in the Typical City Details attached as part of this Manual, where the depth of the sewer main invert exceeds 10 feet below the finished grade of the street, unless otherwise required by the City Engineer or his Designee. Lateral connections shall be made by individual single wyes. Double wyes for connection are not permitted. One tall riser connection may service no more than 2 connections, 1 to each side.

28.05.04 Connections to Manholes

Connections shall be as specified in the Typical City Details attached as part of this Manual. Connections shall be made with a Kor-N-Seal/**A-Lock** type or equal wall penetration boot. Space between boot and pipe OD shall be filled with appropriately sized cavity O-ring. Clay pipe shall have a short nipple (18 inch or 24 inch) between the manhole fitting and the first full length of pipe. All openings for pipes into existing structures shall be made by cutting with a power driven circular coring machine.

28.05.05 Connections to Wet Wells

One joint (18-20 feet) of ductile iron pipe shall extend outward from the structure. Perform connections as for manholes.

28.05.06 Conflicting Structures and Protection of Sanitary Sewer at Utility Crossing

Where it becomes necessary to extend sewers through structures, such as conflicting manholes, junction boxes, etc., the pipe shall be ductile iron within a casing pipe with no joints inside the conflicting structure. Where the vertical separation between sanitary sewer and storm sewer is less than 18 inches, the sanitary sewer shall be installed as polyethylene lined ductile iron pipe.

Section **28.06** TESTING

28.06.01 PVC Ring Deflection

Maximum diameter ring deflection shall not exceed 5% of the internal pipe diameter throughout the warranty period when tested by a mandrel. The mandrel shall be a GO-NO-GO type with an unequal number of runners, minimum of 9, and a maximum distance between the runners of 2 inches. A gauging ring certified for each size of pipe inside diameter and the mandrel size shall be as follows:

<u>Table 28-2</u>	
<u>Pipe Size</u>	<u>Mandrel Diameter</u>
8"	7.37
10"	9.22
12"	10.98
15"	13.43

Should the test fail, necessary repairs shall be accomplished by the Contractor and the test repeated until within the established limits. The Contractor shall furnish the necessary labor, water, and all other items necessary to conduct the required testing and perform the necessary system repairs required to comply with the specified test. On pipes determined to have excessive deflection, the length in question shall be relayed or replaced.

28.06.02 Infiltration/Exfiltration

There shall be no detectable level of infiltration or exfiltration from the system at the time of inspection. Any evidence of exceeding the limits of 28.07.02 must be corrected prior to acceptance by the City. This includes both line and manholes.

Section **28.07 CCTV INSPECTION STANDARDS**

28.07.01 PART 1 – GENERAL

28.07.01.01 Scope of Work

- A) These specifications cover the testing and inspection for acceptance of wastewater and storm-water collection and transmission systems.
- B) Requests for testing and acceptance of wastewater and storm-water collection and transmission systems shall be executed in accordance with Article 26 and Article 32.
- C) Gravity Mains:
Shall be inspected with CCTV for alignment, grade variations, separated pipes, leaks, deflection, cracked, broken or otherwise defective pipe to ensure overall pipe integrity. The CCTV inspection contractor shall perform the CCTV inspection(s) and submit the electronic files and report(s) to the City Engineer as required.

28.07.02 PART 2 - PRODUCTS

28.07.02.01 CCTV Inspection Equipment

- A) Closed Circuit Television Camera:
The television camera used for the inspection shall be color and one that is specifically designed and constructed for sanitary sewer inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100 percent humidity/submerged conditions. The CCTV camera equipment will provide a view of the pipe ahead of the equipment and of features to the side of the equipment through turning and rotation of the lens. The camera shall be capable of tilting at right angles along the axis of the pipe while panning the camera lens through a full circle about the circumference of the pipe.
- B) Lateral Video Camera
Lateral cameras may be push type or launched from the sewer main line. Lateral cameras shall be color, shall be self leveling, and equipped with a footage counter to provide on screen display of footage measurement.

C) Video Capture System:

The video recordings of the sewer inspections shall be made using digital video equipment. The digital recording equipment shall capture sewer inspection on DVD disks or hard drive, with each sewer reach inspection recorded as an individual movie file (.MPEG, .MPG, or .WMV) or approved equal.

1. The video file names will be referenced in the inspection database and in an inspection report generated in PDF format. The pipeline collection and real time video capture and data acquisition systems shall be provided.
2. The system shall use the most current PACP compliant application software and shall be fully object oriented or approved equal. It shall be capable of printing pipeline inspection reports with captured images of defects or other related significant visual information on a standard color printer.
3. The imaging capture system shall store digitized color picture images and be saved in digital format on a DVD, hard drive or approved equal. Also, this system shall have the capability to supply the City of Ocoee with inspection data reports for each line segment.
4. The contractor shall have the ability to store the compressed video files in industry standard and approved the City of Ocoee format and be transferable with the PACP compliant inspection database.
5. The contractor's equipment shall have the ability to "Link". "Linking" is defined as storing the video time frame code with each observation or defect with the ability to navigate from/to any previously recorded observation or defect instantaneously.
6. The system shall be able to produce data reports to include, at a minimum, all observation points and pertinent data. All data reports shall match the defect severity codes in accordance with PACP naming conventions
7. The data-sorting program shall be capable of sorting all data stored using generic sort key and user defined sort fields.
8. Camera footage, date & manhole numbers shall be maintained in real time and shall be displayed on the video monitor as well as the video character generators illuminated footage display at the control console.
9. Depth gage: The camera shall have a depth gage or approved method to measure deflection in the pipe and joint separation approved by the City of Ocoee.

28.07.02.02 Gravity Main Inspection CCTV Data

- A) CCTV data shall be recorded and saved in MPEG format or Windows Media video format.
- B) CCTV inspections shall use unique identification numbers established and provided by the City of Ocoee in pipe segment reference, upstream manhole number and the downstream manhole number fields.
- C) The video files will be named in accordance with the City of Ocoee file naming convention:
Upstream MH ID _ Downstream MH ID _ Inspection Date (year_month_day).wmv.
Example: 39540008_39540007_2009_08_05.wmv
- D) Reports shall be submitted in an electronic version (.pdf) generated by the computer software and shall be consistent with PACP requirements, observation report with still images; and CCTV inspection results.
 - 1. PACP export pipe inspection database (.mdb) saved on CD-R's, DVD, or portable hard drives
 - 2. Inspection digital photographs in JPEG format saved on CD-Rs, DVD or portable hard drives
- E) The video file names will be referenced in the inspection database and in an inspection report generated in PDF format. The pipeline collection and real time video capture and data acquisition systems shall be provided
- F) The system shall use the most current PACP compliant application software and shall be fully object oriented or approved equal. It shall be capable of printing pipeline inspection reports with captured images of defects or other related significant visual information on a standard color printer.
- G) The imaging capture system shall store digitized color picture images and be saved in digital format on a DVD, hard drive or approved equal. Also, this system shall have the capability to supply the City of Ocoee with inspection data reports for each line segment.
- H) The CONTRACTOR shall have the ability to store the compressed video files in industry standard and approved the City of Ocoee format and be transferable with the PACP compliant inspection database.
- I) The CONTRACTOR'S equipment shall have the ability to "Link". "Linking" is defined as storing the video time frame code with each observation or defect with the ability to navigate from/to any previously recorded observation or defect instantaneously.

- J) The system shall be able to produce data reports to include, at a minimum, all observation points and pertinent data. All data reports shall match the defect severity codes in accordance with PACP naming conventions
- K) The data-sorting program shall be capable of sorting all data stored using generic sort key and user defined sort fields.
- L) Camera footage, date and manhole numbers shall be maintained in real time and shall be displayed on the video monitor as well as the video character generators illuminated footage video display at the control console.

28.07.03 PART 3 – EXECUTION

28.07.03.01 Gravity Main Requirements Before CCTV Inspection

- A) All manhole flow channels and benching per specifications shall be constructed and coated (if applicable) prior to CCTV inspection.
- B) CCTV inspections shall be received, reviewed and approved by the City of Ocoee prior to installation of pavement.
- C) The CONTRACTOR shall clean gravity mains to remove debris and stains from the pipe prior to televising. Flushing water or debris will not be allowed to enter pump station wet wells. Water will be pumped from the sewer system during flushing to an acceptable discharge location. A visual inspection shall be made and all obstructions removed.
- D) Gravity Mains/Pipes that are dirty (dirty walls and/or debris in the inverts) shall be re-flushed and cleaned before rescheduling a CCTV inspection. If necessary, swabbing may be required of specific sections of pipe.
- E) The CONTRACTOR shall pass a mandrel through the PVC pipe to confirm if ring deflection is in excess of five percent (5%). The base inside diameter shall be used to determine mandrel size as per ASTM D 3034 and/or ARTICLE 28.
- F) Dewatering systems shall not be operated within 48 hours prior to CCTV inspection.
- G) Backfill from the gravity main to the subgrade shall be compacted and stabilized for inspection and cleaning vehicle access prior to CCTV.

28.07.03.02 Notification

- A) Contractor shall notify the City of Ocoee a minimum of 48 hours prior to performing any CCTV gravity main inspection work.

28.07.03.03 Televising of Gravity Mains

- A) Wherever possible, gravity mains shall be televised in the downstream direction.
- B) Sufficient water shall be run through each section of main until water runs through each downstream manhole no more than 24 hours prior to televising. Lines that are dry or that enough water has not run through to reach the downstream manhole shall not be televised.
- C) Gravity mains shall be televised from manhole to manhole utilizing a 360-degree pan and tilt color camera driven through at a moderate rate of speed not more than 30 feet per min. The camera shall be of the self-propelled tractor type with a measuring device mounted to the front capable of being read as the tractor moves and capable of accurately measuring depth of standing water up to, and including, three inches.
- D) Begin video recording at the top of the manhole to see the condition of the manhole and any pipe that is connected to the manhole. Record going down into the manhole all the way to the preset footage with continuous recording until the down stream manhole.
- E) Lighting should be set to allow for clear visibility without excessive reflection and should allow realistic colors to be visible.
- F) The iris of the camera should be adjusted to allow for a sharp focused image and the lens should be kept clean and free of obstructions.
- G) The operator should follow the manufacturer's instructions to achieve the proper color correction.
- H) All notes or coded references shall have footages recorded with them
- I) The camera should be centered within the pipe.
- J) The distance between manhole centers shall be accurate within 0.5 percent.
- K) The camera shall be stopped at all laterals adjusted for a clear picture and an orbital scan of the lateral taken pausing at the invert at the service lateral to detect dirt or infiltration.
- L) All laterals shall be televised when reaching the lateral if a launch type camera is utilized.
- M) The camera shall also be stopped at any suspected or confirmed defects, the focus properly adjusted and a clear digital video taken.
- N) Areas suspected of leaking shall be paused long enough to determine if a leak exists currently or if deposits have occurred.

- O) A digital photo shall be taken of all areas noted on the report including laterals and any confirmed or suspected defects.
- P) Manholes upstream and downstream shall be measured from rim to invert and the depth recorded on the inspection header in feet and inches.
- Q) Manhole material and defects shall be noted.
- R) Manholes that have laterals tied into them shall have sufficient water run through them and then a CCTV inspection to the property line will be conducted.

28.07.03.04 CCTV QA/QC Inspection Procedures and Causes for Rejection of CCTV Work

- A) The CONTRACTOR shall submit their Quality Assurance Plan and Quality Control procedures to the City of Ocoee. The CONTRACTOR shall ensure data quality and submit the results of the internal quality control checks performed on submitted data.

28.07.03.05 Gravity Main Inspection CCTV Report

- A) The CONTRACTOR will be required to submit the following deliverables on a weekly basis.

1. Inspection Reports are to include:

- a) Inspection session header information (see required fields in Section 2.02 above)
 - b) Defect log report including photo captures from CCTV video
 - c) Schematic drawing of pipe showing defects
 - d) Format: Adobe Acrobat PDF files – 1 report PDF per pipe with the following
 - e) File name format: <upstream MH ID>_<downstream MH ID>_<Date
 - f) (year_mo_day format)>.PDF
 - g) Example: 30060002_30060001_2010_02_16.pdf
- B) The CONTRACTOR shall submit quality control forms that include a hard copy print out of the inspection reports checked with errors and omissions clearly marked
- C) Inspection video files on DVD or portable hard drive, labeled as follows: DVD/Hard drive Labels - Typed labels shall be attached to the face of each DVD. The typed index labels shall include the following information:
 - 1. Content (CCTV)
 - 2. Contractor name

3. Purpose of Survey
4. Tributary Pump station number
5. Reaches included (from Manhole Number ## to Manhole Number ##)
6. Date of survey
7. Contract Number / Delivery Order Number (if applicable)
 - a) Electronic Inspection Data stored and exported in a NASSCO Pipeline
 - b) Assessment and Certification Program (PACP) compliant Microsoft Access
 - c) database (.MDB) version 4.4 delivered on DVD or portable hard drive.
 - d) Inspection photograph digital files (jpeg) indexed to NASSCO PACP
 - e) compliant database.

28.07.03.06 Causes for Rejection of Gravity Mains

- A) The CONTRACTOR shall be required to replace the pipeline if the CCTV inspection reveals cracked, broken or defective pipe, and/or in the case of PVC pipe if a ring deflection is in excess of five percent (5%).
- B) Joint separation shall be no greater than one inch between the spigot and bell of the pipe or as required by the pipe manufacture.
- C) No evidence of leakage will be acceptable for private gravity mains connecting to the City of Ocoee's collection system.
- D) Misalignment resulting in vertical sags in excess of $\frac{3}{4}$ " will require replacement of the gravity main.
- E) The following NASSCO PACP codes or notes shall be cause for rejection of gravity sewer systems
 1. PACP coding of "Line" (L) shall be accompanied by a measurement of the line, grade or angular deviation. Variance of established line and grade at any point along the length of the pipe shall not be greater than 1 inch, provided such variation does not result in a level or reverse sloping invert. An approved method shall be used to determine this deviation. A PACP coding of MWLS with a percentage of pipe greater than 12.5% on 8-inch sewer, 15% on 10-inch sewer etc. will be corrected by excavation and repair.
 2. PACP coding of "Infiltration" (I) for pipe joints shall be replaced or the pipe joint shall be reseated at the joint. Grouting shall not be considered a method of repair and will not be accepted. Replace the leaking gravity main segment if there is visible infiltration at any point other than the pipe joint.
 3. Any PACP coding in the category of "Structural Family".

4. PVC pipe having ID tears will be rejected.

5. PACP condition grading of “OB” (obstruction) in pipe shall be rejected, the obstruction shall be removed and the line cleaned and re-televised.

28.07.03.07 Acceptance

A) Successful passage of both the leakage test and CCTV inspection is required before acceptance by the City of Ocoee.

B) Prior to repair or replacement of failed sewer pipe, the method of repair or replacement shall be submitted to the City of Ocoee for approval. Pressure grouting of pipe or manholes shall not be considered as an acceptable method of repair.

Section 28.08 TESTING PRIOR TO SURFACING

28.08.01 General

All tests shall be completed and accepted by the City Engineer before any trench or pavement is asphalted. Contractor shall provide all testing equipment and material. Lines shall be televised to determine if they were acceptably constructed. Lines to be dedicated to the City and private lines shall be televised by a reputable company experienced in sewer examination. The Contractor shall be present to note required corrections, if any, and schedule remedial action prior to acceptance by the City. In all cases, a stabilized driving surface shall be prepared to allow access to all manholes by TV inspection trucks. The cost of the TV inspections shall be borne by the Contractor installing the line.

28.08.02 Test Procedure

A) All gravity sanitary sewer collection lines and manholes, public and private, which are directly connected to the City collection system shall be tested to insure the minimal exfiltration of wastewater and infiltration of groundwater and stormwater. Lines and manholes shall be tested by either exfiltration and/or infiltration. In the event the exfiltration and/or infiltration test cannot be taken or is inconclusive, the City Engineer at his sole discretion may require a low pressure air test of all or portions of the gravity sewer to be put in service.

B) Line and manholes must be cleaned of all material and meet all other conditions as described by this ARTICLE before proceeding with a test.

C) Exfiltration Test: Where groundwater at the time of testing is near the lowest invert of gravity system to be tested, a passing exfiltration test is required. Exfiltration loss shall not exceed 100 gallons per inch of diameter of pipe per mile tested after a two (2) hour duration.

- D) Infiltration Test: Test sewer system when piping is submerged in groundwater above crown of pipes. Infiltration loss shall not exceed 100 gallons per inch diameter of pipe per mile tested after two (2) hours duration.
- E) Measured Loss: Exfiltration or infiltration loss shall be measured by summing the volumes lost in all test sections of the manholes and pipe.
- F) The low pressure air test method shall be in accordance with ASTM F1417-90 (most current version). Line must be slowly pressurized to four (4) psig (10 psig relief valve required) and hold for two (2) minutes and then slowly release to obtain a pressure to 3.5 psig. Line pressure must not experience a pressure drop greater than 1 psi during the specified testing interval per the following table.

Table 28-3			
Pipe Diameter (In.)	Minimum Test Interval Minutes	Length for Minimal Time (Feet)	Time for Longer Lengths (Feet)
8	7:34	298	1.520 x Length
10	9:26	239	2.374 x Length
12	11:20	199	3.418 x Length
15	14:10	159	5.342 x Length
16	15:10	149	6.282 x Length
18	17:00	133	7.692 x Length

In the event no pressure loss is experienced within half the test interval specified, the test can be discontinued.

- G) Test Sections: Test sections shall be divided to ensure proper testing method. In test sections where groundwater influence cannot be determined, the City Engineer may require both exfiltration and infiltration tests.

Section 28.09 FINAL INSPECTION

After all manholes are raised to grade and paving operations are completed, a final visual inspection shall be made by the City Engineer or his Designee. All manholes shall be examined for proper grade and water tightness. The Contractor shall assist the City Engineer or his Designee by providing all labor as required. The Contractor shall make note of any corrections required and shall perform all remedial actions prior to the acceptance by the City.

Section 28.10 GREASE INTERCEPTORS

The City of Ocoee has a pretreatment program that requires all new sewer usages to comply with all applicable requirements and regulations.

Section 28.11 IDENTIFICATION

For connections of gravity sewer smaller than 12" to pipes larger than 12", the connecting shall be made using a manhole. The crown elevation of the smaller pipe will be required to match the crown elevation of the larger pipe.

ARTICLE 29

SANITARY SEWER FORCE MAINS

Index	29.01	<u>GENERAL</u>
	29.02	<u>DESIGN CRITERIA</u>
	29.03	<u>MATERIALS</u>
	29.04	<u>VALVES</u>
	29.05	<u>INSTALLATION</u>
	29.06	<u>IDENTIFICATION</u>
	29.07	<u>HYDROSTATIC TESTING</u>

[BACK TO TABLE OF CONTENTS](#)

Section	29.01	<u>GENERAL</u>
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This ARTICLE shall govern the design and construction of force mains including valves, fittings, and other appurtenances.

Pipe used in wastewater force main systems shall be either Polyvinyl Chloride (PVC). Ductile Iron Pipe (DIP) or HDPE/Directional Drill may be allowed if prior approval is obtained from the City.

The Contractor shall be responsible for all materials furnished and storage of the same until the date of substantial completion. At the Contractor's expense, all materials found to be defective or damaged in handling or storage shall be replaced. The Contractor shall, if requested by the City, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated Specifications.

Section	29.02	<u>DESIGN CRITERIA</u>
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	29.02.01	<u>Design Period</u>
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Force main systems shall be designed for the estimated ultimate tributary population, as derived from the City's approved future land uses and/or historical flows. In the event the approved City of Ocoee Wastewater Master Plan, latest edition, identifies components of the force main under consideration, the largest capacity consideration shall be required.

	29.02.02	<u>Design Calculations</u>
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Owner's/Developer's Engineer shall submit signed, sealed and dated design calculations with the plans for all force main projects. Calculations shall show that force mains will have sufficient hydraulic capacity to transport all design flows. The Design Flow shall be the Peak Flow Rate.

29.02.03 Sanitary Sewer Collection System Hydraulic Modeling

The City of Ocoee maintains a sanitary sewer collection hydraulic model (Bentley SewerCAD) which is used for but not limited to determining system performances, pump runtimes and efficiencies, and offsite impacts. For developments that may substantially add to or impact the City sanitary sewer collection system, the Owner/Developer shall cause the incorporation of the development elements into the City's model and the simulation/analyzing of the model. Unacceptable operating conditions and/or offsite impacts created by the proposed development shall be remediated by the Owner/Developer.

This effort to be undertaken by Owner/Developer can be done by either the developer's engineer performing the model work with a City review or by electing to have the City undertake the work. The election for the City to perform the work shall require City approval. All costs incurred by the incorporation and outside reviews by the City shall be at the Owner/Developer's expense. All final products shall become the property of the City.

29.02.04 Velocity and Diameter

At design pumping rates, a cleansing velocity of at least 2 feet per second shall be maintain/Achieve. Maximum velocity at design pumping rates shall not exceed 5 feet per second. The minimum force main diameter shall be 4 inches with the exception of 2" sleeved applications in conjunction with the application of a minor lift station. Only 4", 6", 8", 10", 12", 16", 20", 24", 30", 36", 42", 48" and 54" diameter force mains shall be permitted.

29.02.05 Design Friction Losses

Friction losses through force mains shall be based on the Hazen-Williams formula. In the use of Hazen-Williams formula, the value for "C" shall be 100 for ductile iron pipe, 120 for PVC pipe and HDPE pipe. When initially installed, force mains may have a significantly higher "C" factor. The higher "C" factor shall be considered only in calculating maximum power requirements and duty cycle time of the motor.

29.02.06 Design Pressure and Restraint

The force main and fittings, including all restrained joint fittings and thrust blocking, shall be designed to withstand pump operating pressures and pressure surges, but not less than 150 psi. The required lengths of restrained joints shall be determined by the Engineer and shown in a tabular form as depicted on the "Restrained Pipe Table" in the Typical City Details attached as part of this Manual. Thrust blocks shall not be typical and shall only be used when the City Engineer deems it a hardship or good engineering standards deem it necessary because restraining assemblies are impractical or insufficient. If thrust blocks are used, the bearing area of thrust blocks shall be adequate to prevent any movement of the fitting. The sizes and dimensions of the thrust blocks shall be shown in a thrust block table.

29.02.07 Termination

Force mains shall not terminate directly into a gravity sewer line. Force mains shall enter the terminal facility, gravity sewer manhole, pumping station wet well or other, at a point equal to the operational water level of said receiving unit and not more than 1 foot above the flow line. Should an elevation drop be required to obtain the outlet connection, the prior down-slope of the force main shall not exceed 45°. Adequate air venting shall be provided at the profile break-point.

29.02.08 Air Release and Vacuum Relief Valves

Where the force main profile is such that air pockets or entrapment could occur, resulting in flow blockage, provisions for air release shall be provided. Automatic air release assemblies shall be installed, where venting is required, on all major force mains and at critical points on lesser mains. At profile break points on major force mains, such as tops of hills, etc., where free flow will occur during operation or after pumping stops, combined air release and vacuum valve assemblies shall be provided. Air and vacuum valves and/or air release valves shall be as capacity requires and, if in an open area, they shall be suitably housed in a properly vented, underground chamber (vault/manhole). All such valves shall be clearly delineated on the force main profile in the detail sheets. The Owner's/Developer's Engineer shall submit calculations to the City justifying the valve sizing.

29.02.09 Aerial Crossings

A) Structural Support

Support shall be provided for all joints in pipes utilized for aerial crossings. The supports shall be designed to prevent overturning and settlement.

B) Expansion Protection

Expansion joints shall be provided between the aerial and buried sections of the pipe.

C) Flood Clearance

For aerial stream crossings, the impact of flood waters and debris shall be considered. The bottom of the pipe shall be placed no lower than 1 foot above the 100 year flood elevation.

D) Pipe Material and Joints

Flanged joints shall be used. Pipe and flange material shall be a lined ductile iron, minimum class 53. All aboveground pipe shall be painted as specified in ARTICLE 29 of this Manual for aboveground wastewater force mains. Use of epoxy coated steel pipe may be allowed on a case-by-case basis.

E) Valves

Underground valves shall be provided at both ends of the crossing so that the section can be isolated for testing or repair. The valves shall be easily accessible and not subject to flooding. An air release/vacuum relief valve shall be installed at the high point of the crossing.

F) Guards

Appropriate guards shall be installed at both ends of the crossing to prevent pipe access to the public.

G) Permits and Requirements of Other Agencies

It shall be the responsibility of the Owner/Developer to obtain all applicable regulatory permits. When the Aerial Crossing is accomplished by attachment to a bridge or drainage structure, the Owner/Developer shall meet all requirements of the Agencies who own or have jurisdiction over such structures.

29.02.10 Underwater Crossings

A) Pipe Material and Cover

Underwater Crossings shall be directional drilled with HDPE pipe. Fusible PVC may be used with Specific Approval. The Owner/Developer shall provide, for City approval, a signed, sealed and dated design report. Report shall include but not be limited to a geotechnical report with installation recommendations. Both design and geotechnical reports must be signed, dated and sealed by a Florida licensed Professional Engineer.

B) Valves

Valves shall be provided at both ends of the water crossings so that the section can be isolated for testing or repair. The valves shall be easily accessible and not subject to flooding. Both valves shall be provided in a manhole or a valve vault.

C) Permits

It shall be the responsibility of the Owner/Developer to obtain all applicable regulatory permits, including dredge and fill permits and/or sovereign lands.

29.02.11 Additional Requirements

While designing force main systems, consideration shall be given to possible future connecting pumping stations. If applicable, this requirement shall be reviewed with the City prior to finalization of the design.

Section **29.03** **MATERIALS**

29.03.01 **PVC Pipe**

All PVC pipe of nominal diameter 4" through 12 inches shall be manufactured in accordance with AWWA standard C-900. The PVC pipe shall have a minimum working pressure rating of 150 psi and shall have a dimension ratio (DR) of 25. Pipe shall be the same OD as ductile iron pipe. PVC pipe shall be AWWA Standard C-900, DR 18.

29.03.02 **PVC Joints**

PVC pipe shall have integral bell push-on type joints conforming to ASTM D-3139.

29.03.03 **Fittings for PVC Pipe**

Fittings used with PVC pipe shall conform to Section 27.03.05.

29.03.04 **Ductile Iron Pipe**

All ductile iron pipe of nominal diameter 4 through 54 inches shall conform to ANSI/AWWA A-21.51/C-151. A minimum of Pressure Class 350 pipe shall be supplied for all sizes of pipe unless a higher class pipe is specifically called out or required by the City.

29.03.05 **Fittings**

All fittings shall be mechanical joint ductile iron or gray iron conforming to ANSI/AWWA A-21.10/C-110, 250 psi minimum pressure rating, or ductile iron compact fittings 4 through 12 inches in accordance with ANSI/AWWA A-21.53/C-153.

29.03.06 **Joints for DIP**

Joints for ductile iron pipe and fittings shall be push-on or mechanical joints conforming to ANSI/AWWA A-21.11/C-111, unless otherwise specifically called out or required by the City. Where called for on the Drawings, restrained or flanged joints shall be provided. Flanged joints shall conform to ANSI Standard B-16.1-125 lb restrained joints shall conform to ARTICLE 26 of this Manual.

29.03.07 Coatings and Linings for DIP

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the coating shall be a minimum 1.0 mil thickness in accordance with ANSI/AWWA A-21.51/C-151. Where ductile iron pipe and fittings are to be installed above ground, the pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer. Intermediate and finished field coats of Alkyd shall also be applied by the Contractor (minimum 1.5 mils dry thickness each coat). Primer and field coats shall be compatible and shall be applied in accordance with the manufacturer's recommendations. (See approved Manufacturer's List attached as part of this Manual.) Final field coat color shall be green for raw wastewater.

All ductile iron pipe and fittings shall have interior protective lining of Protecto 401 shall be provided with a minimum dry thickness of 40 mils or equivalent applied by the pipe manufacturer.

29.03.08 Polyethylene Encasement

The pipe shall be polyethylene encased (8 mil) where shown in the Typical City Details or required by the City in accordance with ANSI/AWWA A-21.51/C-105.

29.03.09 Directional Drill/HDPE

HDPE pipe shall be used for directional drill application. See ARTICLE 33 for requirements.

Section 29.04 VALVES

Sufficient valves shall be provided on force main systems to facilitate effective isolation of the pipe system for repairs and maintenance. On straight runs of force mains, valve spacing shall not exceed 1,000 feet. Additional valves shall be provided where force mains intersect to facilitate isolation of pipe segments.

29.04.01 Plug Valves

Plug valves shall have a semi-steel body, non-lubricated, eccentric type, 100% port opening with resilient faced plugs capable of drip-tight, bi-directional, shut-off at the full rated pressure. Exposed valves shall have flanged connections. Buried valves shall have mechanical joint connections. Gear actuators for valves 8 inches or larger shall be provided.

29.04.02 Check Valves

Check valves shall have an iron body, bronze-mounted, stainless steel hinge pin, outside spring operated, swing non-slam type, equipped with removable inspection covers. Units shall be rated for 150 psi minimum working pressure and permit full flow area equal to that of the connecting pipe.

29.04.03 Air Release Valves

Air release valves shall have a polimer or stainless steel body, minimum 150 psi working pressure, equipped with a vacuum ball to prevent air return and a properly sized blow off valve. All pipe, hardware, and isolation ball valves shall be per Standard Manufacturer's List Detail.

29.04.04 Tapping Sleeves and Valves

Tapping Sleeves shall be a joint type with flanged outlet per ANSI B-16.1, Class 125. Valves shall be gate valves specially designed for wet tapping and compatible with the connecting sleeve.

29.04.05 Valve Boxes

Valve boxes shall be adjustable, cast iron and suitably sized to the valve with a minimum diameter of 5 inches. The cover shall have the word "SEWER" legibly cast into the face. Boxes shall be suitable for H-20 loading.

Section 29.05 INSTALLATION

29.05.01 General

Excavation and backfill including sheeting and bracing, dewatering, bedding and foundation, and furnishing and disposal of materials shall be as required in ARTICLE 6 Table 6-1 of this Manual.

29.05.02 Pipe Laying

All pipe shall be laid "in-the-dry" along straight lines and grades between fittings, manholes, or other defined points, unless definite alignment deflections or grade changes are necessary. The standard minimum cover for sewage force main systems shall be 3 feet from the top of the pipe to finished grade. Where waterways, canals, ditches, or other cuts are crossed, either jack and bore, or directional drill shall be required. Additionally, approved utility crossing signs shall be placed on the pipe alignment at each side of the canal, etc. All materials shall be maintained and all coatings shall be protected from damage and kept clean. The interior of the pipe shall be maintained clean and free of dirt and debris. When work is not in progress, plug all open ends. Underground piping shall not be driven to grade by striking it with an unyielding object. Bell holes in the bedding shall be provided to allow uniform load bearing along the pipe barrel.

29.05.03 Push-on Joints

The pipe bell and spigot shall be thoroughly cleaned immediately prior to inserting the gasket and jointing. The gasket shall be properly faced and positioned. Lubrication shall be in accordance with the manufacturer's recommendations. Pipe shall be protected against damage from jointing equipment by using timber headers, etc.

29.05.04 Mechanical Joints

The socket and plain end shall be wiped clean. The plain end, socket, and gasket shall be washed with a soap solution immediately prior to jointing. The joint shall be kept straight during assembly with the gasket pressed firm and even into the recess. Bolts shall be tightened such that the gland remains reasonably parallel to the flange by alternating from bolt to bolt in cycles. The required bolt size (pipes 4 inches to 24 inches in diameter) shall be $\frac{3}{4}$ inches, torqued to 75-90 ft-lbs.

29.05.05 Flange Joints

Make all flanged joints tight, without applying undue strain upon the joint or other appurtenances. Joints shall be fitted such that contact surfaces bear uniformly on the gasket with relatively uniform bolt stresses.

29.05.06 Connections at Structures

Where pipes are to extend into or through structures, Link Seal-Type penetration seals shall be provided at the wall face. Openings in existing structures shall be made with a circular core boring machine.

29.05.07 Pipe Cutting

Cutting of pipes for the insertion of valves, fittings, or closure pieces shall be done in a neat, workmanlike manner without damaging pipe coatings or linings. The pipe shall be cut with an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, or milling wheel saw. Cut ends and rough edges shall be ground smooth and, for push-on joint connections, the cut end shall be beveled. Where castings or linings have been damaged, apply two coats of a Coal Tar/Bitumastic Coating. Where protective linings are provided within the interior of the pipe, repair of the lining shall be completed in accordance with the lining manufacturer's recommendations. All coatings and lining materials shall be in accordance with the Approved Manufacturer's List.

29.05.08 Pipe Restraint

All plugs, caps, tees, and bends, unless otherwise specified, shall be restrained by the use of approved restraint glands, and/or restrained joints. Components of dissimilar metal shall be protected against corrosion by hand application of a bituminous coating. Backfilling over pipe restraints shall not proceed until inspected by the City Engineer or his Designee. Thrust blocks shall not be typical and shall only be used when the City Engineer deems it a hardship or good engineering standards deem it necessary because restraining assemblies are impractical or insufficient. If thrust blocks are used, the bearing area of thrust blocks shall be adequate to prevent any movement of the fitting. The sizes and dimensions of the thrust blocks shall be shown in a thrust block table.

29.05.09 Polyethylene Encasement

Extra protection shall be provided for underground cast or ductile iron pipe and fittings within areas of severe corrosive conditions. This shall be accomplished by the installation of polyethylene encasement through the area of concern. The soil-test evaluation to determine the necessity for extra protection in suspect areas shall be as set forth in ANSI Standard A-21.5.

29.05.10 Aboveground Pipe Support

Support exposed systems, as necessary, to hold the piping and appurtenances in a firm substantial manner to the required lines and grades with no undue piping stresses transmitted to the equipment. All above ground pipe, outside of buildings, shall be supported by concrete supports.

29.05.11 Connections

Tapping shall be by tapping sleeve and valve installed with a tapping device designed for the pipe material.

29.05.12 Valve Installation

Valves shall be installed on all subsidiary force mains at the point of connection to the major main, in order to isolate said pipeline for maintenance. Where force mains are to be extended, valves shall be placed at the future connection points so as to preclude line shut-down at the time of extension. All valves shall be opened wide and then tightly closed. Nuts and bolts shall be inspected for tightness. Special care shall be taken to prevent joint materials, stones, and other substances from becoming lodged in the valve seat. Any valve that does not operate correctly shall be replaced.

Unless otherwise noted, set valve stems vertically above the center-line of the pipe. Where extension stems are required within valve boxes, insert stems shall be provided.

29.05.13 Valve Boxes

All valve boxes shall be centered over the operating nut of underground valves to permit a valve wrench to be easily fitted to the nut. Top of boxes shall be set to final grade. The valve box shall not transmit surface loads directly to either the pipe or valve. Excessive care shall be used to prevent earth and other materials from entering the boxes. Any valve box that becomes out of alignment or is not to grade shall be dug out and adjusted. A concrete collar shall be provided as specified in the Typical City Details attached as part of this Manual.

29.05.14 Air and Vacuum Valves

Where the force main profile is such that air pockets or entrapment could occur, resulting in flow blockage, provisions for air release shall be provided. Automatic air release assemblies shall be installed, where venting is required, on all major force mains and at critical points on lesser mains. At profile break points on major force mains, such as tops of hills, etc., where free flow will occur during operation or after pumping stops, combined air release and vacuum valve assemblies shall be provided. Air and vacuum valves and/or air release valves shall be as capacity requires and, if in an open area, they shall be suitably housed in a properly vented, underground chamber (manhole).

29.05.15 Terminal Discharge

Force mains shall not terminate directly into a gravity sewer line. Force mains shall enter the terminal facility, gravity sewer manhole, pumping station wet well or other, at a point equal to the operational water level of said receiving unit and not more than 1 foot above the flow line. The receiving manhole shall be either lined with an approved liner or be constructed of an approved material that prevents degradation due to the creation of gas in the structure. Should an elevation drop be required to obtain the outlet connection, the prior down-slope of the force main shall not exceed 45°. Adequate air venting shall be provided at the profile break-point.

Section 29.06 IDENTIFICATION

In order to preclude possible domestic water tapping, all installed underground PVC sanitary sewer force mains shall be green in color. DIP or HDPE pipe shall be marked with a continuous stripe painted in accordance with 62-655-320 (21) (b) 3 F.A.C. Said stripe shall be a minimum 2 inches in width and shall be green in color. Backfill shall not be placed for 30 minutes following paint application. In addition, all pipe shall be buried with non-metallic warning/identification tape above the top of the pipe, see the Typical City Details. The tape shall indicate the presence of a sanitary force main plainly on the tape face. PVC pipe shall be buried with a locating wire properly affixed to the main.

Section 29.07 CROSS CONNECTION CONTROL

In order to protect the public water supply system from contamination due to cross connections, the Developer shall install City approved backflow prevention devices where there is the potential of a non-potable substance coming into contact with the public water system. All backflow prevention devices shall comply with the City of Ocoee's Manual of Cross Connection Control and the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California (FCCCHR)

Section 29.08 HYDROSTATIC TESTING

This test shall be performed by the Contractor, with the Contractor's labor and equipment, in the presence of the City Engineer or his Designee. No testing shall proceed until all restraining devices are installed or thrust blocks have cured. Clean and flush all piping thoroughly prior to testing. The amount of water to be used shall be twice the volume of the pipe being tested and the velocity of flow shall be a minimum of 3 fps. During filling of water, all air shall be carefully permitted to escape through release cocks installed as required.

The hydrostatic test shall be performed at 150 psi for a period of 2 hours per AWWA C-600. The maximum allowable leakage shall not exceed that determined by the following formula:

$$L = \frac{(N)(D)(P)^5}{3700} = \text{Allowable leakage in gals per 2 hr}$$

$$L = 0.00270 ND; \text{ for 100 psi test for 2 hours}$$

$$N = \text{Number of joints in the section tested}$$

$$D = \text{Nominal pipe diameter in inches}$$

$$P = \text{Average test pressure maintained during the leakage test in psig (gauge)}$$

During the 2 hour period of the test, the Contractor shall maintain a continuous pressure of 150 psi by means of a pump taking supply from a container suitable for the measurement of water loss. Should the test fail, the leak shall be located and repaired and the test performed again until it meets the above specified limits.

ARTICLE 30

SANITARY SEWER PUMP STATION

Index	30.01	<u>GENERAL</u>
	30.02	<u>SITE</u>
	30.03	<u>BUOYANCY</u>
	30.04	<u>EXCAVATION AND BACKFILL</u>
	30.05	<u>GRADING</u>
	30.06	<u>HANDLING</u>
	30.07	<u>WET WELLS</u>
	30.08	<u>PIPE, VALVES AND FITTINGS</u>
	30.09	<u>PUMPS</u>
	30.10	<u>MOTORS</u>
	30.11	<u>SHOP PAINTING</u>
	30.12	<u>TELEMETRY SYSTEMS</u>
	30.13	<u>ELECTRICAL POWER AND CONTROL SYSTEM</u>
	30.14	<u>LIGHTS AND ALARMS</u>
	30.15	<u>ELECTRICAL GROUNDING SYSTEM</u>
	30.16	<u>STANDBY POWER GENERATOR SYSTEM</u>
	30.17	<u>FENCING</u>
	30.18	<u>TOOLS AND SPARE PARTS</u>
	30.19	<u>PUMP STATION WATER SYSTEM</u>
	30.20	<u>INSPECTION AND TESTING</u>
	30.22	<u>LIFT STATION SERVICES</u>
	30.21	<u>REQUIRED SUBMITTALS</u>
	30.22	<u>MINOR LIFTSTATION</u>

[BACK TO TABLE OF CONTENTS](#)

Section	30.01	<u>GENERAL</u>
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This ARTICLE shall govern the design, construction and application of all wet pit sewage pumping stations, typical and minor, to include the wet well, influent piping from receiving manhole, effluent piping (to the wye), valves, valve boxes and covers, pumps and motors, hatches, bypass pumping appurtenances, control panel, flow meter, telemetry system, electrical service and wiring, and testing for a complete installation ready to operate. Design and layout of the system must be approved by the City Engineer or his Designee prior to construction. The system shall be designed and sized for peak flow.

Section	30.02	<u>LIFT STATION STANDARDS AND THIS ARTICLE</u>
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The City maintains both Major and Minor Lift Station Standards and Details that shall be used in conjunction with ARTICLE 30 to establish the requirements for any lift stations to be dedicated to or constructed by the City. Any conflicts between ARTICLE 30 and the standard details shall be resolved in the more stringent criterion and/or requirement.

Section 30.03 SITE

Pump station sites shall be sized as delineated in the Typical City Details attached as part of this Manual. Owner/Developer shall dedicate pump station site by warranty deed or plat to the City. Dedicated easements shall also be required around the site as delineated in the Typical City Details attached as part of this Manual. In general, the site for the paved access road shall also be dedicated to the City by warranty deed or plat. Exceptions to this requirement may be allowed by the City Engineer or his Designee on a case by case basis in the form of an ingress/egress easement for the access road. The pumping station shall be readily accessible by maintenance vehicles during all weather conditions. All access to the pumping station shall be paved. The facility shall not be located in road rights-of-way. In a phased development, a stabilized access road may be accepted during the initial phase with paving to be accomplished in the later phase.

Wastewater pumping station structures and electrical and mechanical equipment shall be protected from physical damage by the 100 year flood by setting the top slab elevation a minimum of one foot above the 100 year flood elevation determined for the site and shall not be located within the flood way. Wastewater pumping stations shall remain fully operational and accessible during the 100 year flood event. Regulations of Local, State and Federal agencies regarding flood plain obstructions shall be considered.

Section 30.04 BUOYANCY

Buoyancy of the pump station structures shall be considered and adequate provisions shall be made for protection. Signed and sealed calculations shall be provided to the City by the Design Engineer.

Section 30.05 EXCAVATION AND BACKFILL

Excavation and backfill (including sheeting and bracing), dewatering, bedding and foundation, and furnishing and disposal of materials shall be as required in ARTICLE 6, Table 6-1.

Section 30.06 GRADING

The site shall be graded so as to direct runoff away from structures and appurtenances and electrical system. Pavement slopes shall not be less than 0.6% or exceed 2% within station confines. Earth grading extending from pavement for the first 10 feet shall not exceed 10: 1 cross slope and thereafter not exceed 3:1.

Section 30.07 HANDLING

All parts and equipment shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation. Finished surfaces of all exposed pump openings shall be protected by wooded planks, strongly built and securely bolted thereto. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.

Section 30.08 WET WELLS

Wet wells shall be to the same requirements as sanitary sewer manholes with the following additional requirements:

- A) The base shall be monolithic with lower ring.
- B) The base slab and top slab shall be constructed to the dimensions specified in the Typical City Details attached as part of this Manual. The wall thickness and inside diameter of the wet well shall be constant over its full depth. Generally, the minimum acceptable inside diameter for a wet well shall be 6 feet, however sufficient space for installed equipment, required suction pipe submergence and spacing shall be provided. A minimum of 24 inches between shut off and lead pump start levels shall be provided. Low water level shall provide adequate submergence to prevent pump inlet from vortexing, air binding, or other operational problems.
- C) A minimum 5 foot depth from the lowest invert and the off Float shall be provided.
- D) The maximum high water level shall be less than the low pipe influent invert, with the high water alarm no higher than the mid-depth point of said pipe.
- E) Brick construction shall not be acceptable.
- F) Wet well shall be free from all detectable leaks. Any leaks detected shall be corrected prior to acceptance by the City.
- G) Coating per the Approved Manufacturer's List.
- H) All concrete sanitary wetwells shall be lined with spray on Green MonsterTM Liner at a 90 to 110 mil thickness or approved equal approved by the City.

Section 30.09 PIPE, VALVES AND FITTINGS

30.09.01 General

All exposed pipe shall have flanged joints with 316 stainless steel bolts with stainless steel plastic inserted nylock nuts. All buried pipes shall have restrained joints. All exposed metallic piping shall be coated with an approved material refer to Approved Manufacturer's List. The riser pipe from the pump base to the valve vault shall be fusion welded HDPE and shall be joined to the equipment with the proper fusion welded flange adapters and shall include support as specified in the Typical City Details attached as part of this Manual.

30.09.02 Pipe Material

All piping from valve box to one (1) joint past wye including bypass pumping extension shall be ductile iron pipe. Pipe material from receiving manhole to wetwell shall be HDPE of equal inside diameter to pipe entering receiving manhole.

Section 30.10 PUMPS

30.10.01 General

The equipment covered by these Specifications is intended to be standard pumping equipment of proven ability as manufactured by a reputable firm having at least 5 years experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with the best practices and methods, and shall operate satisfactorily when installed as specified in the Typical City Details attached as part of this Manual.

Pumps shall be submersible and of a dual rail system - dual rail pumps with dual rails. Pump station shall be capable of pumping the peak design flow with any one pumping unit out of service. Pumps shall be capable of meeting all system hydraulic conditions without motors overloading. In addition, a minimum 5 HP motor shall be required. Head-capacity (performance) curves shall verify that pumps are operating at peak efficiency for application. The system head-capacity analysis shall provide the following and be subject to review by the City Engineer or his Designee:

- A) System operation under peak flow conditions, with one pump or multiple parallel pumping, as designed. If the receiving force main system is interconnected to additional pumping stations, hydraulic modeling conditions shall also include said pumping systems operating at rated capacity.
- B) Pumping capability with one pump running, all units operating in parallel and other combinations, if applicable.

- C) Design engineer shall provide Hydraulic Analysis for peak, average and low pressure conditions and verify that new station will not adversely impact existing stations.

All parts shall be so designed and proportioned as to have liberal strength and stiffness, and to be especially adapted for the work to be done. Ample space shall be provided for inspection, repairs, and adjustment. All necessary foundation bolts, plates, nuts, and washers shall be furnished by the equipment manufacturer, and shall be of Type 316 stainless steel. Brass or stainless steel nameplates giving the name of the manufacturer, voltage, phase, rated horsepower, speed, and any other pertinent data shall be attached to each pump. The nameplate rating of the motors shall not be exceeded.

Two pumps shall be required for all stations discharging 2,000 gallons per minute or less. Additional pumps shall be required as necessary for larger flows. A minimum 5 minutes run time and no more than 8 successive starts of pumps must be maintained for peak flow conditions. Pumps shall alternate operation automatically. The pumps shall be capable of handling raw unscreened domestic wastewater and minimum 3 inch diameter solid spheres. Pump operation shall be controlled automatically by means of a SCADA Control System with a float back-up system. Pumps shall be mounted in the wet well as specified in the Typical City Details attached as part of this Manual. See approved Manufacturer's List attached as part of this Manual. For approved pumps and SCADA equipment.

30.10.02 Installation

Equipment shall be installed in accordance with approved shop drawings and manufacturer's instructions to operate as intended by the manufacturer. Shop drawings shall be sent to the Engineering Department for review prior to installation of equipment. Upper guide rail holders shall be located exactly as required.

- A) Shaft

The pump shaft shall be of Series 300 or 400 series stainless steel or carbon steel. When a carbon steel shaft is provided, the manufacturer shall demonstrate that any part of the shaft which will normally come in contact with the wastewater has proven to be corrosion resistant in this application. The shaft and bearings shall be adequately designed to meet the maximum torque required for any start-up or operating condition and to minimize vibration and shaft deflection. As a minimum, the pump shaft shall rotate on 2 permanently lubricated bearings. The upper bearing shall be a single row ball bearing. The lower bearing shall be a 2 row angular contact ball bearing, if required, to minimize vibration and provide maximum bearing life.

B) Impeller

The impeller shall be constructed of gray cast iron, ASTM A-48, class 30. All external bolts and nuts shall be of Type 304 stainless steel. Each pump shall be provided with a replaceable metallic wear ring system to maintain pump efficiency. As a minimum, one stationary wear ring provided in the pump volute or one rotating wear ring provided on the pump impeller shall be required. A two part system is acceptable.

C) Mechanical Seal

Each pump shall be provided with a tandem double mechanical seal running in an oil reservoir, composed of two separate lapped face seals, each consisting of one stationary and one rotating tungsten carbide ring with each pair held in contact by a separate spring, so that the outside pressure assists spring compression in preventing the seal faces from opening. The compression spring shall be protected against exposure to the pumped liquid. Silicone carbide may be used in place of tungsten carbide for the lower seal. The pumped liquid shall be sealed from the oil reservoir by one face seal and the oil reservoir from the air-filled motor chamber by the other. The seals shall require neither maintenance nor adjustment, and shall be easily replaceable. Conventional double mechanical seals with a single spring between the rotating faces, requiring constant differential pressure to effect sealing and subject to openings and penetration by pumping forces shall not be considered equal to tandem seal specified and required.

D) Guides

A sliding guide bracket shall be an integral part of the pump casing and shall have a machined connecting flange to connect with the cast iron discharge connection, which shall be bolted to the floor of the wet well with stainless steel anchor bolts and so designed as to receive the pump discharge flange without the need of any bolts or nuts. Sealing of the pumps to the discharge connection shall be accomplished by a simple linear downward motion of the pump with the entire weight of the pumping unit guided by no less than 2 Type 316 seamless tubular stainless steel guides per pump, which will press it tightly against the discharge connection. No portion of the pump shall bear directly on the floor of the wet well and no rotary motion of the pump shall be required for sealing. Sealing at the discharge connection by means of a diaphragm or similar method of sealing shall not be accepted as an equal to a metal to metal contact of the pump discharge and mating discharge connection specified and required. Approved pump manufacturers, if necessary to meet the above specification, shall provide a sliding guide bracket adapter. The design shall be such that the pumps shall be automatically connected to the discharge piping when lowered into place on the discharge connection. The pumps shall be easily removable for inspection or service, requiring no bolts, nuts or fastenings to be removed for this purpose, and no need for personnel to enter the wet well. Each pump shall be fitted with a minimum ¼ inch 316 stainless steel cable, air craft rating, to remove the pumps from the wet well. The cable shall be of sufficient size to accommodate removal of the pump without breaking.

30.10.03 Pump Warranty

The pump manufacturer shall warrant the units being supplied to the City against defects in workmanship and material for a period of 5 years or 10,000 hours.

Section 30.11 MOTORS

30.11.01 General Requirements

All motors shall be built in accordance with latest NEMA, IEEE, ANSI and AFBMA Standards and be UL listed where applicable. Pump motors shall be housed in an air-filled, water-tight casing and shall have Class F insulated windings which shall be moisture resistant. Motors shall be NEMA Design B, rated 155°C maximum. Pump motors shall have cooling characteristics suitable to permit continuous operation, in a totally, partially or non-submerged condition. The pump shall be capable of running continuously in a non-submerged condition under full load without damage, for extended periods. The motor shall be capable of a minimum of 10 starts per hour. If required by the City, and before final acceptance, a field running test demonstrating this ability, with 24 hours of continuous operation under the above conditions, shall be performed for all pumps being supplied. Motors below 20 horsepower shall be rated 240/480 volt, 3 phase. Motors 20 horsepower and greater shall be 480 volt, 3 phase.

30.11.02 Heat Sensors

Each motor shall incorporate a minimum of 1 ambient temperature compensated overheat sensing device. This protective device shall be wired into the pump controls in such a way that if excessive temperature is detected the pump will shut down. This device shall be self-resetting.

30.11.03 Cables

Cables shall be designed specifically for submersible pump applications and shall be properly sealed. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the motor interior from foreign material gaining access through the pump top. Sealing systems utilizing epoxy potting compounds may be used. All cables shall be continuous without splices from the motor to the control panel, unless otherwise approved by the City.

The junction chamber, containing the terminal board, shall be perfectly leak proof.

Section 30.12 SHOP PAINTING

Before exposure to weather and prior to shop painting, all surfaces shall be thoroughly cleaned, dry and free from all mill-scale, rust, grease, dirt and other foreign matter. All pumps and motors shall be shop coated with a corrosion resistant paint proven to withstand an environment of raw wastewater. All nameplates shall be properly protected during painting.

Gears, bearing surfaces, and other similar surfaces obviously not to be painted shall be given a heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during periods of storage and erection and shall be satisfactory to the City up to the time of the final acceptance test.

Section 30.13 TELEMETRY SYSTEMS

Telemetry systems shall be provided on all public stations. The system shall be the newest version of the radio transmission unit Hyper Server Module from Data Flow Systems. System shall be able to monitor/calculate such information as flow rates, cycle times and ambient/run system pressures as well as proving control for the station.

Section 30.14 ELECTRICAL POWER AND CONTROL SYSTEM

30.14.01 General

This Section specifies the electrical power and control system requirements for wastewater pump stations. These requirements apply to duplex pump panels. Similar requirements shall apply when more than 2 pumps are involved except for the quantity of control equipment and panel size shall be increased accordingly. The manufacturer of the control panel shall provide data to indicate that the manufacturer has a minimum of 3 years experience in the building of pump control panels.

Lightning arrester, surge suppressor, pump disagree sensors, emergency disconnect switch, telemetry system, flow meter and totalizer, emergency generator plug, red alarm light, and convenience outlet shall be provided as specified in the Typical City Details attached as part of this Manual.

30.14.02 Control Panel

A pump station control panel shall be provided for each wastewater pump station. (See approved Manufacturer's List attached as part of this Manual.) The control panel shall be factory assembled and tested prior to installation at the pump station. Contractor shall provide for coordination between pump manufacturer and panel manufacturer to assure that the control panel as a whole, as well as the individual components, comprise a system which is intimately compatible with the pumps. The following equipment shall be included in the panel for duplex pump stations: Main breakers (2), pump circuit breakers (2), 20 amp panel circuit breaker, starters (2), alternator, elapsed time meter for each pump, run lights (2), HOA switches (2), pump disagree timer, phase voltage monitor relay, SCADA RTU with a radio telemetry unit, and an Auto-dialer. All switches, main circuit wiring, breakers and other devices shall be clearly and neatly labeled inside the control panel. Quantities will be required to be increased for stations with more than two pumps. See the Typical City Details attached as part of this Manual. A single line wiring diagram shall be included within the panel with a copy provided for the City's records.

30.14.03 Pump Alternator

An 8 pin plug-in solid state alternator (see approved Manufacturer's List attached as part of this Manual) shall be provided to change the pump starting sequence on each pumping cycle. A 3 position alternator test switch shall be provided to control the alternation operation. Switch positions to include the "Auto" to provide normal automatic sequence, "Off" position to disable alternator, and "Test" position with a spring return to allow the alternating of the pump sequence to check alternator operation.

30.14.04 Motor Starter and Selector Switches

The panel shall contain 2 motor starters. The motor starter shall be across the line magnetic starter with individual overload protection on each power leg with reset installed through the inner door unit. (See approved Manufacturer's List attached as part of this Manual.) Local Power Company Regulations shall govern.

Selector switches shall be installed on the face of the inner door unit. Selector switch shall be a heavy duty oil tight "Hand-Off-Auto" 3 position switch to control the operation mode of each pump motor starter.

30.14.05 Motor Circuit Protectors

Each pump motor shall be protected by a 3 pole motor circuit protector. (See approved Manufacturer's List attached as part of this Manual.) The Motor Circuit Protector shall be operated by a toggle-type handle and shall have a quick-make, quick-break, over center switching mechanism that is mechanically trip-free from the handle so that the contacts cannot be held closed against a short circuit and abnormal current, causing the Motor Circuit Protector to trip. Tripping shall be clearly indicated by the handle automatically assuming a position midway between the normal ON and OFF positions. All latch surfaces shall be ground and polished. All poles shall be so constructed that they open, close, and trip simultaneously. Motor Circuit Protector must be completely enclosed in a high-strength, glass polyester molded case. Ampere ratings shall be clearly visible. Contacts shall be of non-welding silver alloy. Arc extinction must be accomplished by means of arc chutes. A manual push-to-trip button shall be provided for manual exercising of the trip mechanism. Each pole of these Motor Circuit Protector's shall provide instantaneous short circuit protection by means of an adjustable magnetic-only element.

30.14.06 Power Supply and Main Disconnect

Power supply to the control panel shall be either 240 volt, 3 phase, 4 wire or 480 volt, 3 phase, 4 wire. Minimum service shall be 100 amp. Single phase power shall not be accepted.

Non-fusible safety service main disconnects shall be installed at all stations. In all 240 volt systems, disconnects shall be installed between the meter and the panel and on all 480 volt systems disconnect shall be installed ahead of the meter. LED power available indicators shall be supplied on all legs.

30.14.07 Circuit Breakers

A) General

The control-panel shall include main circuit breakers and generator breaker with mechanical interlock, a circuit breaker and magnetic starter for each pump motor, and 20 amp, 120 volt circuit breakers as required.

B) Main Breakers

The panel shall have an inter-lock system between the normal power main breaker and the emergency breaker to ensure only one breaker is in the “on” position at a time. Both breakers shall be equal in size. (See approved Manufacturer's List attached as part of this Manual.)

C) Circuit Breakers

All circuit breakers shall be heavy duty molded case breakers. The handle on the circuit breakers shall be operational through the inner door. (See approved Manufacturer's List attached as part of this Manual.)

D) Padlock Attachment

A Square D HPAFK (or approved equal) handler padlock attachment shall be installed on all motor circuit breakers.

30.14.08 Emergency Power Receptacle

This item shall only be required on stations that do not have a permanent standby generator system. The panel shall have an external mounted generator receptacle of the required size. (See approved Manufacturer's List attached as part of this Manual.)

30.14.09 Wiring

All power wires shall be THW or THWN 75°C insulated stranded copper conductors, and shall be appropriately sized for the given load application. All control circuit wire shall be type THW, size 14, stranded type. All wiring within the enclosure shall be neatly routed by the use of slotted type wiring duct with snap on type covers. Wiring on the rear of the inner door shall be neatly bundled with nylon ties and include sufficient loop across the hinges to prevent wire damage, with each end of conductor marked (I.D.). Colors shall be red for 24 volt, white for neutral, black for 120 volts.

30.14.10 Terminal Points

Terminal points of all terminal strips shall be permanently identified. All terminal numbers and identifying nomenclature shall correspond to and be shown on electrical diagrams. All wiring shall be permanently shown on electrical schematic diagrams.

30.14.11 Engraved Nameplates

All circuit breakers, control switches, indicator pilot lights, and other control devices shall be identified with permanently affixed legend plates and lamicoid-type engraved nameplates where applicable.

30.14.12 Surge Protector

A surge protector shall be included and wired to protect motors and control equipment from lightning induced line surges. All surge protectors shall be UL approved and installed per respective power company requirements and manufacturers' specifications, surge protectors shall be attached to the main disconnects.

30.14.13 Elapsed Time Meters

Elapsed time meters shall be 115 volt non-reset type and shall totalize pump running time in hours and tenths of hours to 99999.9 hours.

30.14.14 Convenience Receptacle

On the face of the inner door unit, there shall be installed a 20 amp, 120 volt, duplex convenience receptacle. It shall be provided with it's own single pole, 20 amp circuit breaker for protection. Ground fault interrupt type shall be required.

30.14.15 Control Terminal Blocks

Control terminal blocks shall be of the clamp screw type, rated for 600 volts. Amperage rating shall accommodate the control circuit amperage. An additional 10 space terminal strip shall be installed in the cabinet for future use, in addition to the required number of terminals for alarms or signals as specified in the Typical City Details attached as part of this Manual.

30.14.16 Control Power Transformers

There shall be a control power transformer with a minimum size of 500 volt (AC) to provide 120 volt (AC) power for: coils for starters, 20 amp duplex receptacle, indicator pilot lights, alarm horn, alarm light, pump alternator, elapsed time meters etc. The secondary side shall have one leg fused and the other grounded. This control power transformer is required only on 480 volt control panels.

The signal required by the float switches and relays shall be 24 volt (AC). This shall be provided by a 24 volt (AC) control power transformer properly sized with a fused secondary.

30.14.17 Control Relay

The level control relays shall operate from 24 volt (AC). They shall be enclosed, plug-in 8 pin type with octal-style screw terminal sockets.

30.14.18 Electrical Schematic

There shall be permanently affixed to the interior side of the exterior enclosure door an electrical schematic diagram and a copy supplied to City personnel at start-up. The schematic diagram shall include the rated amperage and voltage for all components.

30.14.19 Phase Monitor

For all 240 volt stations an eight pin plug-in type phase monitor shall be provided for protection of electrical components due to phase loss. Adequate dummy pin protection shall be provided to prevent accidental interchanging of the eight pin phase monitor with the eight pin alternator. All 480 volt stations shall have surface mount type phase monitors.

30.14.20 Battery Backup

A 12 volt (DC) battery shall be supplied on all lift stations to insure operation of the SCADA system in the case of a power outage. Refer to the Typical City Details attached as part of this Manual.

30.14.21 Operation

The control panel shall respond to a pressure transducer coupled with SCADA control system as well as redundant liquid level float switches to automatically start and stop pumps as well as sound an alarm upon high or low wet well levels.

The control panel shall operate 2 electrical submersible pumps at the power characteristics stipulated. The control function shall provide for the operation of the lead pump under normal design conditions. If the incoming flow exceeds the pumping capacity of the lead pump, the lag pump shall automatically start to handle this increased flow. As the flow decreases, pumps shall be cut off at elevation as shown on the plans. Pumps shall alternate positions as lead pump at the end of timing cycle. A failure of the alternator shall not disable the pumping system. The alternator shall include a safe, convenient method of manual alternation and also have provisions to prevent automatic alternation without disturbing any wiring. Should the "pump off" regulator fail, the system shall keep the station in operation and provide a visual indication of the regulator failure.

Normal operations shall be governed by the pressure transducer coupled with the SCADA control system. Upon abnormal wet well levels all pump control operations shall automatically revert to the redundant float type liquid level control system. These control components shall be mounted in one common enclosure. Control switches shall provide means to operate each pump manually or automatically. When operated in the automatic mode, the control assembly shall provide means to manually select or automatically alternate the position of the "lead" and "lag" pumps after each pumping cycle. A float type liquid level control system shall continuously monitor wet well liquid level and control

operation of the low-level cutoff for the pumps and shall operate off a 24 volt circuit. Alternate methods of liquid level measurement in the wet well may be considered on a case by case basis.

30.14.22 Housing

The duplex pump panel shall be housed in a NEMA 3R, Type 304, 14 Gauge stainless steel enclosure. Enclosure shall have provisions for padlocking the door and a dead front inner door unit for mounting controls. All exterior hardware and hinges shall be stainless steel. The outer door shall include a 3-point latch and stainless steel door handle as manufactured by Hoffman or approved equal.

There shall be, permanently affixed to the interior side of the exterior enclosure door, both a nameplate and a 10 inch x 12 inch pocket for log sheet storage. The nameplate shall contain the following information: voltage, phase, rated horsepower, speed, date manufactured and pump and control panel manufacturer's name, address and telephone number, pump data, including impeller data, operating point and head, KW input, and amperes at the operating point and at least 2 other points on the pump curve.

The control panel enclosure shall be Underwriters Laboratories (UL) 50 type 4X Listed.

30.14.23 Testing and Warranty

After fabrication in the control panel manufacturer's plant, an operational test shall be performed to check out the entire panel before delivery. Three phase source voltage to which the panel is intended for shall be used for the testing. The control panel manufacturer shall maintain a service organization in the State of Florida that is available for service. The manufacturer shall furnish a 5 year warranty against defects in materials and workmanship covering parts and labor on all items supplied under this Section.

Section 30.15 LIGHTS AND ALARMS

30.15.01 Indicator Lights

Heavy duty, oil tight, indicator lights as specified in the Typical City Details attached as part of this Manual shall be installed on the face of the inner door unit.

30.15.02 High Level Alarm

Two mercury float ball switches shall be provided as high and low level backup alarm switches to the telemetry system and to the red alarm signal light. A vapor proof red light and horn shall be mounted on top of the control panel enclosure for high level alarm. Also, there shall be an alarm silence push button on the inner door and a silence relay which will silence the horn and automatically reset when these signals are restored to normal. The push button shall be heavy duty oil tight. The red globe shall be the screw-on type.

Section 30.16 ELECTRICAL GROUNDING SYSTEM

30.16.01 General

A grounding system shall be installed as per National Electrical Code, Local Codes and Ordinances. The Drawings shall clearly show the Electrical Grounding System. An underground perimeter cable grounding system shall be installed with connections to at least the following equipment:

- A) Wet well cover.
- B) Valve vault cover.
- C) Control panels.
- D) Generator.
- E) Utility company transformer.
- F) Main disconnect switch.
- G) Fence.

30.16.02 Material and Installation

The Drawings shall show details of material and installation to construct a completely functional and operational Electrical Grounding System.

Section 30.17 STANDBY POWER GENERATOR SYSTEM

30.17.01 General

A standby power generator system shall be installed at pump stations as required by this Manual for electrical power during the loss of normal power. Standby power generators shall be provided at all stations having the following characteristics:

- A) 35 or greater total combined brake horsepower.
- B) Peak design capacity of 1,000 gpm or more.

- C) Arterial stations receiving flow from at least one other service area.
- D) Service area includes critical users as determined on a case by case review.
- E) Station with three or more pumps.

Generators shall be complete with all controls, automatic switchgear and shall produce 240 volts (AC), or 480 volts (AC), 3 phase, 4 wire power. Generator and controls shall be installed in an approved enclosure.

30.17.02 Generator Set General

The generator set shall consist of a diesel engine directly coupled to an electric generator, together with the necessary controls and accessories to provide continuous electric power to the lift station for the minimum duration of a 48 hour failure of the normal power supply.

A complete engine generator system shall be furnished and installed with fuel transfer pump, fuel day tank, battery, battery charger, muffler, radiator, control panel, remotely mounted automatic transfer switch (part of the control panel), and all other accessories required for an operational system. All materials and parts of the generator set shall be new and unused. Each component shall be of current manufacture from a firm regularly engaged in the production of such equipment. The set shall be of a standard model in regular production at the manufacturer's place of business. Units and components offered under the Specifications shall be covered by the manufacturer's standard warranty on new machines.

30.17.03 Requirements

The emergency generator set and accessories shall be of a type that complies with the latest edition of the National Electrical Code and all applicable state and local building codes.

The material and workmanship used in the manufacture of this equipment shall be of the highest quality consistent with the current standards for like equipment, and the equipment shall be manufactured in such a manner so as to conform to the latest applicable IEEE, ANSI, ISA, NEMA, and EEIA Standards.

The equipment supplier shall be liable for any latent defects due to faulty materials or workmanship in the equipment which may appear within 1 year from the date of equipment start-up.

30.17.04 Tests

Equipment shall be completely assembled and tested at the factory prior to shipment. Certified copies of the data obtained during these tests shall be submitted to the City.

Final tests, in the presence of the City's representative, shall be conducted at the site after installation has been completed. The emergency generator manufacturer shall furnish a service representative to operate the engine during the tests, to check all details of the installation and to instruct the City's representatives in proper equipment operation.

Field tests shall include operating the diesel generating set for 8 hours, carrying normal lift station loads. The Contractor shall refill the main fuel tank at the completion of the tests.

30.17.05 Ratings

The rating of the generator shall be as specified in the Typical City Details attached as part of this Manual. These ratings must be substantiated by the manufacturer's standard published curves. Special ratings shall not be acceptable. The set shall be capable of supplying the specified usable KW for the specified duration, including the power required for the pump start-up, without exceeding its safe operating temperature.

30.17.06 Engine

The engine shall be water cooled, four stroke cycle, compression ignition diesel, LP or natural gas. The engine shall be equipped with fuel, lube oil and intake air filters; lube oil coolers, fuel transfer pump, fuel priming pump, and gear-driven water pump, where applicable. The engine and generator shall be torsionally compatible to prevent damage to either engine or generator.

An engine instrument panel shall be installed on the generator set in an approved location. The panel shall include oil and fuel pressure and water temperature gauges. A mechanically driven engine hour meter shall also be provided.

The engine governor shall be of the isochronous electronic type. Frequency regulation shall not exceed $\pm 0.25\%$ under steady state conditions. The engine shall start and assume its rated load within 10 seconds, including transfer time.

30.17.07 Generator

The generator shall be a 3 phase, 60 hertz, single bearing, synchronous type, built to NEMA Standards. Epoxy impregnated Class F insulation shall be used on the stator and the rotor.

The excitation system shall employ a generator-mounted, volts-per-hertz type regulator. Voltage regulation shall be $\pm 2\%$ from no load to full load. Readily accessible voltage drop, voltage level and voltage gain controls shall be provided. Voltage level adjustment shall be a minimum of $\pm 5\%$.

30.17.08 Engine Generator Control Panel

A generator mounted NEMA 3R type 304, vibration isolated, 14 gauge stainless steel control panel shall be provided. Panel shall contain, but not be limited to, the following equipment:

A) Control Equipment

Control equipment shall consist of all necessary exciter control equipment, generator voltage regulators, voltage adjusting rheostat, speed control equipment, and automatic starting controls, as required to satisfactorily control the engine/generator set. In addition, an automatic safety shut down shall be provided for low oil pressure and/or high temperature conditions in the engine. An emergency shut down lever switch shall be provided on the air intake.

B) Metering Equipment

Metering equipment shall include 3½ inch meters (dial or digital type frequency meter, 2% accuracy voltmeter, and ammeter and ammeter-voltmeter phase selector switch). The control panel shall also include the engine water temperature, lube oil pressure and hour meter.

C) Fault Indicators

Individual press-to-test fault indicator lights for low oil pressure, high water temperature, low water level, over speed, over crank, and for day tank high and low fuel level shall be provided.

D) Function Switch

A four position function switch marked “Auto”, “Manual”, “Off/Reset”, and “Stop” shall be provided.

30.17.09 Battery Charger

The battery charger shall be so designed that it shall not be damaged and shall not trip its circuit protective device during engine cranking or it shall be automatically disconnected from battery during cranking period. The charger shall be mounted in the emergency generator control panel. The charger shall have a 7 day/24 hour timer control.

30.17.10 Battery

The battery shall be lead-acid type with sufficient capacity to provide 90 seconds total cranking time without recharging. The battery shall be adequately rated for the specific generator set. The battery shall be encased in hard rubber or plastic and shall be furnished with proper cables and connectors, together with rack and standard maintenance accessories. The battery shall be provided with a 48 month warranty for replacement if found to be defective.

30.17.11 Base and Mounting

A suitable number of spring-type vibration isolators with a noise isolation pad shall be provided to support the set and its liquids.

30.17.12 Utility Connections

All connections to the generator set shall be flexible.

30.17.13 Cooling System

The generator set shall be equipped with an engine mounted radiator sized to maintain safe operation at 110°F maximum ambient at the pump station altitude. A blower type fan shall be used directing the air flow from the engine through the radiator. The entire cooling system shall be filled with 50% glycol-water solution.

30.17.14 Fuel System

An above ground, vaulted, main fuel oil storage tank with float switch, and fuel level indication, LP or natural gas tank shall be furnished and installed by the Contractor. The emergency system shall include low fuel level contacts for remote alarm. If necessary to guard against loss of prime to pump, a check valve shall be mounted on pump intake. The emergency system shall include a float switch, fuel level gauge and standard control panel.

Above ground vaulted fuel oil tanks shall be equipped with an overfill containment system supplied by the tank manufacturer.

Fuel oil piping, including mounting of any required fuel tanks, shall be furnished and installed by the Contractor and shall have double wall containment for all piping. The Contractor shall be required to permit the fuel system through the County and FDEP.

30.17.15 Exhaust System

The generator set supplier shall provide a critical-type silencer, with flexible exhaust fittings, properly sized and installed, according to the manufacturer's recommendation. The silencer shall be mounted so that its weight is not supported by the engine. The exhaust system shall not exceed residential noise limit requirements.

Exhaust pipe size shall be sufficient to ensure that measured exhaust back pressure does not exceed the maximum limitations specified by the generator set manufacturer. The exhaust system shall include a flexible, seamless, stainless steel connection between the engine exhaust outlet and the rest of the exhaust system. The exhaust system shall be a part of generator enclosure.

30.17.16 Weatherproof Enclosure

Enclosure and all other items shall be designed and built by engine manufacturer as an integral part of the entire generator set, and shall be designed to perform without overheating in the ambient temperature specified. Enclosure shall be constructed of 14 or 16 gauge sheet metal suitably reinforced to be vibration free in the operating mode. Four hinged doors shall be provided to allow complete access without their removal. Each door shall have at least 2 latch-bearing points. Side and rear panels shall be completely and simply removable for major service access. Roof shall be peaked to allow drainage of rain water. Baked enamel finish with primer and finish coat shall be painted before assembly. All fasteners shall be rust resistant. Unit shall have sufficient guards to prevent entrance by small animals. Padlocks shall be provided. Batteries shall be designed to fit inside enclosure and alongside the engine. Batteries under the generator are not acceptable. Unit shall have coolant and oil drains outside the unit to facilitate maintenance. Each drain line shall have a high quality valve located near the fluid source. Fuel filter shall be inside the base perimeter and located so spilled fuel cannot fall on hot parts of engine or generator. A cleanable primary fuel strainer shall be used to collect water and sediment between tank and main engine fuel filter. Crankcase fumes disposal shall terminate in front of the radiator to prevent oil from collecting on the radiator core and reducing cooling capacity.

30.17.17 Automatic Transfer Switch

The automatic transfer switch shall be part of the control panel. The transfer switch shall be provided with the following features:

- A) Complete protection, close differential voltage sensing relays monitoring all 3 phases (pick-up set for 95% of nominal voltage, drop-out set for 85% nominal voltage).
- B) Voltage sensing relay on emergency source (pick-up set for 95% of nominal frequency).

- C) Time delay on engine starting--adjustable from 1 second to 300 seconds (factory set at 3 seconds).
- D) Time delay normal to emergency transfer--adjustable from 0 second to 300 seconds (factory set at 1 second). The Contractor shall request time delay settings in accordance with the priority rating or their respective loads.
- E) Time delay emergency to normal transfer--adjustable 30 seconds to 30 minutes (factory set at 5 minutes), and time delay bypass switch shall be provided on door of the switch cabinet.
- F) Unload running time delay for emergency engine generator cooling down--adjustable from 0 to 5 minutes (factory set at 5 minutes) unless the engine generator control panel includes the cool down timer.

30.17.18 Warranty

Products shall be guaranteed to be free from defects in material and workmanship under normal use and service for a period of 1 year after start-up.

Section 30.18 FENCING

All pump station sites shall be fenced. However, exception to this requirement on a case by case basis and subject to sufficient landscape screening. The Contractor shall furnish and erect the chain link fence and gate in accordance with these Specifications and in conformity with the lines, grades, notes and typical sections as specified in ARTICLE 20 and the Typical City Details attached as part of this Manual.

Chain link fence shall be 6 feet high, in accordance with this Manual. One 12 foot double swing drive gate (two 6 foot leaves), hinged to swing through 180° from open to close to open, with center drop rod assembly latch (no post) and gate hold backs for both leaves shall be installed, complete with latches, locking device, stops keeper, hinges, fabric and braces. Gate shall open outward from station. Gates shall be the same height as the fence and the gate fabric shall be the same as the fence fabric. Gate leaves less than 8 feet wide shall have truss rods or intermediate braces and gate leaves 8 feet or more in width shall have intermediate braces and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist.

All posts shall be set 3 feet deep in concrete footings, 12 inches in diameter for line posts, gate and corner posts. After the post has been set, aligned and plumbed, the hole shall be filled with 3,000 psi concrete. The concrete shall be thoroughly worked into the hole so as to leave no voids. The exposed surface of the concrete shall be crowned to shed water.

Section 30.19 TOOLS AND SPARE PARTS

One set of all special tools required for normal operation and maintenance shall be provided. All such tools shall be furnished in a suitable steel tool chest complete with lock and duplicate keys.

The pump and control panel manufacturer(s) shall provide a suggested list of spare parts for the equipment being supplied for the pump station. The cost of the spare parts shall not be less than \$5,000.00 based upon the manufacturers published suggested list price for the parts. The City will review the recommended list and will either approve or modify the list as they deem necessary. Any modifications made to the list will be made so that the cost remains within the above required limit. All spare parts are required to be provided to the City prior to final inspection and start-up of the station.

Section 30.20 PUMP STATION WATER SYSTEM

All wastewater pump stations shall be provided with a water system with adequate capacity and pressure for station wash down and other requirements. The station water system shall be completely separated from the potable water supply by means of a metered, reduced pressure type backflow preventer

Section 30.21 INSPECTION AND TESTING

A factory representative knowledgeable in pump operation and maintenance shall inspect and supervise a test run at the pumping station in the presence of the City Engineer or his Designee. The City shall be provided 24 hour notice before this inspection is to commence. A minimum of 1 working day shall be provided for the inspections. Additional time made necessary by faulty or incomplete work or equipment malfunctions shall be provided as necessary to meet the requirements in this Manual at no additional cost to the City. Upon satisfactory completion of the test run, the factory representative shall issue the required manufacturer's certificate.

The test run shall demonstrate that all items of this Manual have been met by the equipment as installed, and shall include, but not be limited to, the following tests:

- A) That all units have been properly installed.
- B) That the units operate without overheating or overloading any parts and without objectionable vibration.
- C) That there are no mechanical defects in any of the parts.
- D) That the pumps can deliver the specified pressure and quantity.
- E) That the pumps are capable of pumping the specified material.
- F) That the pump controls perform satisfactorily.

Section 30.22 LIFT STATION SERVICES

The necessary utility services (electrical power, telephone, water) shall be provided by the Owner/Developer and accounts for such services shall be transferred to the City of Ocoee prior to issuance of a Certificate of Completion for facilities that are to be dedicated to the City.

Section 30.23 REQUIRED SUBMITTALS

Submittals shall be provided to the City, for any lift stations to be taken over by the City, in triplicate and include the following:

- A) As-Built Drawings providing a detail showing fencing, gates, all important details of construction, dimensions, anchor bolt locations, and the flow meter and valve pit relative to the lift station, including but not limited to all elevations, such as inverts, floor elevations and finished grades, etc. All the above improvements shall be included inside the fenced-in area. The approach road and driveway shall also be shown. The Drawing shall be fully dimensioned and in State Plane coordinates.
- B) Descriptive literature, bulletins, and/or catalogs of the equipment, both hard copy as well as electronic "PDF" files.
- C) Data on the characteristics and performance of each pump. Data shall include guaranteed performance curves, based on actual shop tests of similar units, which show that they meet the specified requirements for head, capacity, efficiency, NPSHR, submergence and horsepower. Curves shall be submitted on 8½" by 11" sheets, at as large a scale as is practical. Curves shall be plotted from no flow at shut off head to maximum manufacturer recommended pump capacity. Catalog sheets showing a family of curves will not be acceptable.
- D) Complete layouts, wiring diagrams, telemetry or control schematics, including coordination with other electrical control devices operating in conjunction with the pump control system. Suitable outline drawings shall be furnished for approval before proceeding with manufacture of any equipment. Standard preprinted sheets or drawings simply marked to indicate applicability will not be acceptable.
- E) A drawing showing the layout of the pump control panel shall be furnished. The layout shall indicate all devices mounted on the door and the panel shall be completely identified.
- F) The weight of each pump.
- G) Complete motor data shall be submitted including:
 - 1) Nameplate identification.
 - 2) No-load current.

- 3) Full load current.
- 4) Full load efficiency.
- 5) Locked rotor current.
- 6) High potential test data.
- 7) Bearing Inspection report.

Section 30.24 MINOR LIFT STATION

The City has developed a minor wastewater pump station for small service areas to promote the City's effort to extend centralized sewer and mitigate certain impacts to development for land owners. This application of this station is limited as stated below and is only applicable to stations that will be dedicated to the City. The City established the application of a minor lift station, by specifically specifying pump make, model, and size, wetwell type and size, and all the stations applicable appurtenances. The modification and/or substitution of any critical element of the minor station shall not be allowed.

The approved application of the Minor Lift station shall be subject to all of the following conditions:

1. Developments that cannot feasibly gravity flow to an existing City sewer collection manhole or pump station; and
2. Developments provide an acceptable lift station site with collection and discharge routing access to either be by fee simple dedication(s) or granted easement(s); and
3. Developments connecting to a manhole or existing forcemain where pumping from the minor lift station discharge is not less than (4) feet per second at peak system pressures and ultimate service shall not require runtime of greater than 60% during peak hour; and
4. Station shall ultimately realize service to three (3) or more developments; and
5. Ultimate volume-metric service to the station shall be 10 or greater equivalent residential units (ERU) but no more than 40 ERUs.

ARTICLE 31

POTABLE WATER SYSTEMS

Index	31.01	<u>GENERAL CONSIDERATIONS</u>
	31.02	<u>DESIGN BASIS</u>
	31.03	<u>DETAILS OF DESIGN AND CONSTRUCTION</u>
	31.04	<u>WATER METERING</u>
	31.05	<u>WATER SERVICES AND CONNECTIONS</u>
	31.06	<u>SERVICE PIPE, STOPS, FITTINGS, AND SERVICE SADDLES</u>
	31.07	<u>WATER MAIN MATERIALS</u>
	31.08	<u>WATER MAIN INSTALLATION</u>
	31.09	<u>VALVE INSTALLATION</u>
	31.10	<u>IDENTIFICATION</u>
	31.11	<u>SEPARATION OF WATER MAINS AND SEWERS</u>
	31.12	<u>TRENCH PREPARATION AND PIPE BEDDING</u>
	31.13	<u>HYDROSTATIC TESTS</u>
	31.14	<u>DISINFECTION OF WATER MAINS</u>
	31.15	<u>FIRE HYDRANTS</u>
	31.16	<u>CROSS CONNECTION CONTROL</u>

[BACK TO TABLE OF CONTENTS](#)

Section	31.01	<u>GENERAL CONSIDERATIONS</u>
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	31.01.01	<u>Type of Water Mains</u>
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The City will approve plans for potable water supply mains and extensions (herein this ARTICLE as water main) only when such mains are designed and constructed in accordance with the criteria set forth in this Manual.

	31.01.02	<u>Design Period</u>
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Water mains shall be shall be designed for the estimated ultimate tributary population, as derived for the City's approved future land uses and/or historical flows. Potable water main shall also consider flows for fire protection demand. In the event the approved City of Ocoee Water Master Plan or Study, latest edition, identifies components of the watermain under consideration, the largest capacity consideration shall be required.

31.01.03 Location

Water mains shall be located in dedicated rights-of-way or utility easements. When installed in rights-of-way, water mains shall, in general, maintain a consistent alignment with respect to the centerline of the road. All water mains located outside of dedicated rights-of-way shall require a minimum 20 foot easement. Additional easement widths shall be provided when the pipe size or depth of cover so dictate. If a water main is located adjacent to a road right-of-way, a minimum 10 foot easement shall be provided. Additional easement widths shall be provided if the pipe size or depth of cover so dictate. Water mains shall not be placed under retention ponds, tennis courts, or other structures. In general, water mains shall not be located along side or rear lot lines. Placement of a water main along side or rear lot line may be allowed on a case by case basis if such a water main configuration results in efficient placement and utilization of the water main network. The criteria shall also apply to water mains in retention pond berms.

Section 31.02 DESIGN BASIS

31.02.01 Average Daily Flow and Peak Flow

Average daily water flow shall be calculated by referencing the Equivalent Residential Unit (ERU) flow rates as outlined below. Peak flow, at a minimum, shall be the average daily flow times a peaking factor of 4. The average daily flow for domestic use shall be calculated at the minimum rate of 100 gallons per day per capita, with 3.5 persons per single family residence, and 2.5 persons per multi-family or mobile home dwelling unit. Maximum hour demand to be used for design shall be 1.0 gallons per minute (gpm) per single family residence and 0.7 gpm per dwelling unit for each multi-family or mobile home unit. Flow demands for commercial, industrial or other special developments shall be established from the estimates provided in current City Ordinance. At the discretion of the City Engineer, existing records of like facilities or estimated projections, using the best available data, may be considered.

31.02.02 Fire Flow Requirements

Fire flow requirements shall be determined in accordance with applicable City Codes. As a minimum, the requirements outlined in the ISO. "Guide to Determining Needed Fire Flow", latest edition, shall be met. In no case shall needed fire flow be less than 750 gpm. Maximum daily flow with fire flow shall not exceed 10 fps. Maximum daily flow, at a minimum, shall be the average daily flow times a factor of 2.

31.02.03 Design Calculations

Owner's/Developer's Engineer shall submit signed, sealed and dated design calculations with the Plans for all water distribution projects. Calculations shall show that the water mains will have sufficient hydraulic capacity to transport:

- A) Peak hourly flows.
- B) A combination of maximum daily flows and fire flows.

All calculations shall meet the requirements of Section 29.03.01. Head losses through meters and backflow devices shall also be included in calculations. The Owner's/Developer's Engineer, at the request of the City, shall perform a nodal analysis of the proposed project along with its effects upon the City's entire system. The City's nodal model shall be obtained and used for this purpose.

31.02.04 Potable Water System Hydraulic Modeling

The City of Ocoee maintains a potable water hydraulic model (Bentley WaterCAD) which is used for but not limited to determining system performances and offsite impacts. For developments that may substantially add to or impact the City's potable water distribution system, the Owner/Developer shall cause the incorporation of the development elements into the City's model and the simulation/analysis of the model. Unacceptable operating conditions and/or offsite impacts created by the proposed development shall be remediated by the Owner/Developer.

This effort to be undertaken by Owner/Developer can be done by either the developer's engineer performing the model work with a City review, or by electing to have the City undertake the work. The election for the City to perform the work shall require City approval. All costs incurred by the incorporation and outside reviews by the City shall be at the Owner/Developer's expense. All final products shall become the property of the City.

The Owner/Developer may request the City to develop the project's nodal model, with input from the Owner's/Developer's Engineer, but this will be performed at the availability of City Staff and at a rate to cover City's cost.

31.03.01 Pressure

All water mains shall be designed in accordance with Section 29.02.03 above. The system shall be designed to maintain a minimum pressure of 20 psi at all points in the distribution system under all conditions of flow. Higher pressures may be required at commercial, industrial and high density residential areas. The normal working pressure in the distribution system should be approximately 55 psi, but in no case less than 35 psi on the downstream side of a meter. For pressures greater than 90 psi special provisions may be required. Design Friction Losses for water mains shall be determined using the Hazen-Williams friction coefficient of C=100. Peak hourly flow shall not exceed 5 fps. Maximum daily flow with fire flow shall not exceed 10 fps.

31.03.02 Diameter

Only 4", 6", 8", 12", 16", 20", 24", 30", 36", 42", 48" and 54" diameter water mains shall be permitted. Four inch water mains shall be permitted only in cul-de-sac areas with a maximum length of 500 feet of pipe. In cul-de-sac areas only, 4 inch looped connections are required to prevent dead ends. As a minimum, 6 inch looped systems shall be required in low density residential projects. Where looping of mains is not practical, minimum 8 inch mains shall be required, unless detailed calculations are submitted to substantiate the sufficiency of a 6 inch main. In commercial, industrial, and high density residential areas, minimum 8 inch looped mains shall be required. Larger size mains shall be required if necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure specified in Section 29.03.01.

31.03.03 Dead Ends

In order to provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins wherever practical, as determined by the City. System looping is required wherever possible to increase overall capacity, service and to maintain quality. Where dead-ends occur, they shall be provided with a fire hydrant or blow-off for flushing purposes. Blow offs shall be sized to provide flows which will give a velocity of at least 2.5 feet per second in the water main being flushed. Where routine and continuous flushing is predicted or determined based on water quality issues, an automatic flushing appurtenance shall be required.

No flushing device shall be directly connected to any sewer.

31.03.04 Valves

Valves shall be provided for all branch connections, loop ends, fire hydrant stubs, or other locations as required to provide an operable, easily maintained, and repaired water distribution system. Valves are to be placed so that the maximum allowable length of water main required to be shutdown for repair work shall be 500 feet in commercial, industrial or multi-family residential areas, or 800 feet in other areas.

31.03.05 Air Relief Valves

At high points in water mains where air can accumulate, provisions shall be made to remove the air by means of hydrants or automatic air relief valves. Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur. Refer to the Typical City Details attached as part of this Manual.

31.03.06 Fire Hydrants

Fire Hydrants shall be considered and designed in accordance with this ARTICLE.

31.03.07 Chamber Drainage

Chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system shall not be connected directly to any storm drain or sanitary sewer, nor shall blow-offs or air relief valves be connected directly to any sewer.

31.03.08 Disinfection Following Repair or Replacement

Any part of the City water system which has direct contact with finished water and has been out of service for repair, alteration, or replacement shall be disinfected as outlined in this Manual or AWWA C-651.

Section 31.04 WATER METERING

31.04.01 General

All water service connections shall be metered. In general, the method of metering shall follow the guidelines listed below. However, the Owner's/Developer's Engineer must obtain approval before finalizing the design of the metering system. Master metering for irrigation for common grounds shall be reviewed and approved by the City Engineer on a case-by-case basis.

31.04.02 Single Family, Duplex, and Multi-Family Subdivisions

Each unit shall be individually metered. However, a variance may be requested for multi-family subdivisions. Single and Double services shall be installed at property lines as specified in the Typical City Details attached as part of this Manual.

31.04.03 Commercial, Industrial, and Institutional Projects

In general, each building shall be individually metered. Meter(s) shall be located in the public rights-of-way at the property line.

31.04.04 Shopping Centers

Each unit shall be individually metered. The meters shall be located either in the right-of-way or within a Utility Easement. The meters shall be located within an unpaved area to facilitate removal, repair and/or replacement without damage to paved surfaces.

31.04.05 Meter Installation

All meter boxes shall be installed by the Contractor at finished grade and level. All meters 2 inches and smaller will be installed by the City after payment of applicable fees and charges. All meters 2 inches in size and smaller shall be installed underground in an approved meter box. Meters larger than 2 inches shall be installed above ground. In general, meters larger than 2 inches shall be located in a meter easement located adjacent to the public right-of-way.

31.04.06 Meter Sizing

Size of all meters shall be determined by the Owner's/Developer's Engineer and approved by the City Utilities Division. The Owner's/Developer's Engineer shall provide sufficient information on estimated peak flows and low flows so that meter size can be evaluated. The Owner's/Developer's Engineer shall include head-losses through metering device when designing the water system.

Section 31.05 WATER SERVICES AND CONNECTIONS

Water services and connections shall conform to the applicable provisions of this Manual and the Typical City Details attached as part of this Manual. Only 1", 1 ½", 2", 3", 4", 6", 8", 10" and 12" services shall be permitted. Where water services greater than 12 inches are required dual services shall be provided. New services and connections to the water system, either new or existing, shall be made by the Contractor.

Water service piping and connection shall be installed as specified in the Typical City Details attached as part of this Manual. The location of all service lines shall be as specified in the Typical City Details attached as part of this Manual and shall be either single or dual service. On curbed streets, the exact location for each installed service shall be marked by etching or cutting a "W" in the concrete curb. Where no curb exists, locations shall be adequately marked by a method approved by the City.

Section 31.06 SERVICE PIPE, STOPS, FITTINGS, AND SERVICE SADDLES

31.06.01 Service Pipe

All service lines shall be 1", 1 ½" or 2" polyethylene tubing conforming to specifications in AWWA C-800 and AWWA C-901.

31.06.02 Stops

Corporation stops shall be 1", 1 ½" or 2" brass, equipped with connections compatible with the polyethylene tubing and threaded in accordance with specifications in AWWA C-800 and AWWA C-901. Curb stops shall be sized to match the meter size and conform to the specifications in AWWA C-800 and AWWA C-901.

31.06.03 Fittings

Fittings shall be brass, cast and machined in accordance with specifications in AWWA C-800 and AWWA C-901, with compatible polyethylene tubing connections.

31.06.04 Service Saddles

A service saddle may be used for all service line taps. Service saddles shall be double strap, anchored by a minimum 4 bolt pattern on a ductile iron saddle body. The City may require a stainless steel strap and fusion epoxy or nylon coated ductile iron body with stainless steel hardware in areas designated as corrosive.

Section 31.07 WATER MAIN MATERIALS

31.07.01 General

These Specifications cover the pipe, fittings, and accessory items used for water distribution systems.

Pipe used in water distribution systems shall be ductile iron pipe (DIP).

The Contractor shall be responsible for all materials furnished and storage of same, until the date of substantial completion. The Contractor shall replace, at the Contractor's expense, all materials found to be defective or damaged in handling or storage. The Contractor shall, if requested by the City, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

31.07.02 Ductile Iron Pipe

All ductile iron pipe of nominal diameter 4 through 54 inches shall conform to ANSI/AWWA A-21.51/C-151. A minimum of Pressure Class 350 pipe shall be supplied for all sizes of pipe unless specifically called out in the detail sheets, or required by the City.

31.07.03 Fittings

Any fittings required shall be mechanical joint ductile iron or gray iron conforming to ANSI/AWWA A-21.10/C-110, 250 psi minimum pressure rating, or ductile iron compact fittings 4 through 12 inches in accordance with ANSI/AWWA A-21.53/C-153.

31.07.04 Joints

Joints for ductile iron pipe and fitting joints shall be push-on or mechanical joints conforming to ANSI/AWWA A-21.11/C-111. Where called for in the plans, restrained or flanged joints shall be provided. Flanged joints shall conform to ANSI Standard B-16.1-125 lb. Restrained joints shall conform to ARTICLE 26 of this Manual.

31.07.05 Coatings and Linings

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the exterior coating shall be a minimum 1.0 mil thick in accordance with ANSI/AWWA A-21.51/C-151. Where ductile iron pipe and fittings are to be installed above ground, pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer. Intermediate and finished field coats of Alkyd shall also be applied by the Contractor (minimum 1.5 mils dry thickness each coat). Primer and field coats shall be compatible and shall be applied in accordance with the manufacturer's recommendations. (See approved Manufacturer's List attached as part of this Manual.) Final field coat shall be dark blue for raw water and blue for finished water.

All ductile iron pipe and fittings shall have an interior protective lining of cement-mortar with an NSF approved seal coat material in accordance with ANSI/AWWA A-21.4/C-104.

31.07.06 Polyethylene Encasement

The pipe shall be polyethylene encased (8 mil) where shown on the detail sheets or required by the City in accordance with ANSI/AWWA A-21.51/C-105.

31.07.07 Resilient Seat Gate Valves

All gate valves 12 inches and smaller shall be resilient seat gate valves. Such valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C-515, latest revision, and in accordance with the following Specifications. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the Connecting Pipe. (See approved Manufacturer's List attached as part of this Manual.)

The valve body, bonnet, and bonnet cover shall be ductile iron. All ferrous surface inside and outside shall have a fusion-bonded epoxy coating. A 2 inch wrench nut shall be provided for operating the valve. All valves are to be tested in strict accordance with AWWA C-515. The valve shall be operated opening counterclockwise.

The valves shall be non-rising stem with the stem made of cast, forged, or rolled bronze as specified in AWWA C-515. Two stem seals shall be provided and shall be of the O-ring type. The stem nut must be independent of the gate.

The resilient sealing mechanism shall provide zero leakage at the water working pressure when installed with the line flow in either direction.

All shut-off valves 16" and larger shall be resilient seat gate with horizontal mechanical gearing and clear passage for pigging devices. Valve shall be as listed in the Approved Manufacturer's List.

31.07.08 Butterfly Valves

Butterfly valves are **not** allowed.

31.07.09 Valve Boxes

All buried valves shall have cast-iron three piece valve boxes. Valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at, or slightly above, the finished grade surface as directed by the City. The barrel shall be 2 piece, sliding type, having 5¼ inch shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall have "WATER" cast into the top for all water mains. The actuating nuts for deeper valves shall be extended to come up to 4 foot depth below finished grade.

Care shall be taken while constructing valve boxes to ensure that valve stems are vertical and the cast iron box has been placed over the stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Contractor shall remove any sand or undesirable fill from valve box prior to final inspection.

31.07.10 Air Release Valves

The air release valves for use in water mains shall be installed as specified in the Typical City Details attached as part of this Manual and the make and model per the approved Manufacturer's List. Valves shall be provided with a vacuum check to prevent air from reentering the line. The fittings shall be threaded.

Section 31.08 WATER MAIN INSTALLATION

31.08.01 General

Pipe shall be installed in accordance with the manufacturer's specifications and instructions for the type of pipe used and applicable AWWA Standards, such as C-600 and C-603, unless otherwise stated in these Specifications. A 2" jumper connection shall be provided for purposes of filling and testing the installed water line prior to clearance for use. The jumper is to be installed per the Typical City Details attached as part of this Manual.

31.08.02 Pipe Handling

All types of pipe shall be handled in such manner as will prevent damage to the pipe or coating. Accidental damage to pipe or coating shall be repaired to the satisfaction of the City or be removed from the job. When not being handled, the pipe shall be supported on timber cradles or on properly prepared ground, graded to eliminate all rock points and to provide uniform support along the full length. When being transported, the pipe shall be supported at all times in a manner which will not permit distortion or damage to the lining or coating. Any unit of pipe that, in the opinion of the City, is damaged beyond repair by the Contractor shall be removed from the site of the work and replaced with another unit. Joint gaskets shall be stored in clean, dark, dry location until immediately before use.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned and relaid. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a water-tight plug or by other means approved by the City to ensure absolute cleanliness inside the pipe.

Section 31.09 VALVE INSTALLATION

All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the City before they are installed. Valves shall be installed in a vertical position and be provided with a standard valve box so arranged that no shock will be transmitted to the valve. The box shall be vertically centered over the operating nut, and the cast iron box cover shall be set flush with the road bed or finished surface. After installation, all valves shall be subjected to the field test for piping as outlined in these Specifications. Should any defects in materials or workmanship appear during these tests, the Contractor shall correct such defects to the satisfaction of the City.

Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe.

Section 31.10 IDENTIFICATION

In order to preclude possible domestic water tapping, all installed underground DIP or HDPE water mains shall be marked in accordance with 62.555.320 (21) (b) 3. Florida Administrative Code. Said stripe shall be a minimum 2 inches in width and shall be light blue in color. Backfill shall not be placed for 30 minutes if field painting is required. In addition, all pipe shall be buried with non-metallic warning/identification tape above the top of the pipe, see the Typical City Details. The tape shall indicate the presence of the water main plainly on the tape face. All PVC pipe shall be buried with a locating wire properly affixed to the main.

Section 31.11 SEPARATION OF WATER MAINS AND SEWERS

31.11.01 General

No water pipe shall pass through or come in contact with any part of a sanitary or storm sewer manhole.

Extreme caution shall be exercised when locating water mains at or near certain sites such as sewage treatment plants or industrial complexes. Individual septic tanks must be located and avoided.

Water mains that are laid in the vicinity of pipe lines designated to carry raw wastewater or reclaimed water (wastewater effluent) shall meet the horizontal and vertical separations specified below. Compliance with all separation requirements of F.A.C. Rule 62-555.314 shall be met as a minimum.

31.11.02 Horizontal Separation

Under normal conditions, water mains shall be located at least 10 feet horizontally from pipes carrying raw wastewater, and 3 feet horizontally from pipes carrying stormwater or reclaimed water. The distance shall be measured from inside edge of pipe to inside edge of pipe.

31.11.03 Vertical Separation

Under normal conditions, water mains shall be laid to provide a separation of at least 18 inches between the bottom of the water main and the top of the wastewater or storm sewer. Under unusual conditions, when construction conditions prevent a vertical separation of 18 inches, a lesser separation in accordance with 62.555.314 may be allowed.

31.11.04 Crossing of Water Mains and Sewers

Water mains shall be above the sewer whenever they cross. A vertical separation shall be maintained as described above. Adequate structural support for both the water main and sewers shall be provided to prevent excessive deflection of joints and settling.

Section 31.12 TRENCH PREPARATION AND PIPE BEDDING

31.12.01 Trench Preparation and Pipe Bedding

Applicable provisions of ARTICLE 6 of this Manual shall apply. Also refer to the Typical City Details attached as part of this Manual.

31.12.02 Pipe Preparation, Handling and Laying

All pipe and fittings shall be inspected prior to lowering into trench to insure no cracked, broken, or otherwise defective materials are being used. Contractor shall clean ends of pipe thoroughly and remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

Contractor shall use proper procedures tools, and facilities for the safe and proper protection of the work. Contractor shall lower pipe into the trench in such a manner as to avoid any physical damage to the pipe and shall remove all damaged pipe from the job site. Care shall be taken to not drop or dump pipe into trenches under any circumstances.

Contractor shall prevent foreign material from entering the pipe while it is being placed in the trench. Contractor shall remove all foreign material from the pipe or joint ring before the next pipe is placed. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into the pipe, the City may require that snugly-fitted, tightly-woven canvas bags be placed over each end before lowering the pipe. The bags shall be left in place until the connection is to be made to the adjacent pipe. During laying operations, Contractor shall keep debris, tools, clothing, or other materials out of the pipe.

All ductile iron pipe shall be installed in accordance with AWWA C-600 unless such Standards conflicts with this Manual, in which case this Manual shall apply. Contractor shall cut pipe only as necessary to comply with alignment shown on the plans. Flame cutting of pipe shall not be allowed. Contractor shall provide special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes shall be permitted under any circumstances.

The pipe shall be polyethylene encased (8 mil) where shown on the detail sheets in accordance with ANSI/AWWA A-21.51/C-105.

31.12.03 Trench Dewatering and Drainage Control

Contractor shall prevent water from entering the trench during excavation and pipe laying operations to the extent required to properly grade the bottom of the trench and allow for proper compaction of the backfill. Pipe shall not be laid in water.

31.12.04 Survey Line and Grade

Pipe shall be laid to the lines and grades shown on the plans. The Contractor shall provide line and grade stakes at a 100 foot maximum spacing and at all line and/or grade change locations. Contractor shall provide Temporary Bench Marks at maximum 1,000 foot intervals. The minimum pipe depth shall be 3 feet below the finished grade surface or 3 feet below the elevation of the edge of pavement of the road surface, whichever is greater.

31.12.05 Laying of Pipes on Curves

Pipe installed on long radius curves, either horizontal or vertical, may be installed with standard pipe by deflections at the joints. Maximum deflections at pipe joints, fitting and laying radius for the various pipe lengths shall not exceed 75 percent of the pipe manufacturer's recommendation.

The maximum allowable tolerance in the joint due to variances in installation is 0.75 degrees (3-inches per joint per 20 ft stick of pipe). No bending tolerance in the pipe barrel shall be accepted. Alignment change shall be made only with sleeves and fittings.

31.12.06 Pipe Restraining and Thrust Block

Requirements specified in ARTICLE 26 of this Manual shall apply.

31.12.07 Bedding and Backfill for Pipes

Requirements specified in ARTICLE 6 of this Manual shall apply.

Section 31.13 HYDROSTATIC TESTS

31.13.01 General

Hydrostatic tests shall consist of pressure test and leakage test. Hydrostatic tests shall be conducted on all newly laid pressure pipes, joints and valves including all service lines to the curb stops. Air testing of pressure pipes shall not be permitted under any circumstance. Tests shall not be made on sections exceeding 2,000 feet. Contractor shall furnish all necessary equipment and material, make all taps, and furnish all closure pieces in the pipe as required. Equipment to be furnished by the Contractor shall include graduated containers, pressure gauges, hydraulic force pumps, and suitable hoses and piping. The City will monitor and approve a satisfactory test.

The Contractor may conduct hydrostatic tests after the trench has been partially backfilled with the joints left exposed for inspection for informational purposes only. The hydrostatic tests for acceptance shall only be conducted after the trenches have been completely backfilled and compacted as specified. Where any section of pipe is provided with concrete thrust blocking, pressure test shall not be made until at least 5 days have elapsed after the thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be reduced to 24 hours if the City concurs that the concrete has cured and reached adequate strength.

31.13.02 Testing Criteria

All pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of 150 psi. The duration of each pressure test shall be for a period of 2 hours. If during the test, the integrity of the tested line is in question, the City may require a 6 hour pressure test. The basic provisions of AWWA C-600 shall be applicable.

31.13.03 Procedure for Pressure Test

Each section of pipe to be tested, as determined by the City, shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made and appropriate valves installed to ensure bleeding of all air from the main. If defective pipes, fittings, valves, or hydrants are discovered in consequence of this pressure test, all such items shall be removed and replaced by the Contractor with sound material and the test shall be repeated until satisfactory results are obtained. Provisions of AWWA C-600, where applicable, shall apply.

31.13.04 Procedure for Leakage Test

After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. Applicable provisions of AWWA C-600 shall apply.

Allowable leakage in gallons per hour for pipeline shall not be greater than that determined by the formula:

$$L = \frac{SD(p)^{1/2}}{133,200}$$

Note: L = Allowable leakage in gallons per hour.

S = Length of pipe tested, in feet.

D = Nominal diameter of the pipe in inches.

P = Average test pressure during leakage test in pounds per square inch gauge.

Leakage is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under test, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. Should any test of pipe laid disclose leakage greater than that allowed, Contractor shall locate and replace or repair the defective joints, pipe or valve until the leakage from subsequent testing is within the specified allowance.

Section 31.14 DISINFECTION OF WATER MAINS

31.14.01 General

Before being placed in service, all new water mains shall be chlorinated in accordance with the Specifications below and the procedures outlined in AWWA C-651 "Standard Procedure for Disinfecting Water Mains".

31.14.02 Flushing

Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a blow-off valve shall be provided large enough to develop a velocity of at least 2.5 feet per second in the main.

All taps required for chlorination or flushing purpose, or for temporary or permanent release of air shall be provided for by the Contractor as a part of the construction of water mains. After the disinfection, all such taps shall be sealed to the satisfaction of the City.

31.14.03 Disinfection Criteria

Before being placed into service, all new mains and repaired portions of, or extensions to existing mains shall be chlorinated so that the initial chlorine residual is not less than 50 mg/l and that a chlorine residual of not less than 25 mg/l remains in the water after standing 24 hours in the pipe.

31.14.04 Form of Applied Chlorine

Chlorine may be applied as a liquid chlorine (gas-water mixture), or a mixture of water and high-test calcium hypochlorite. Contractor shall assume responsibility for safe handling of chlorine and shall meet requirements of OSHA and other regulatory agencies for safe handling of chlorine.

31.14.05 Point of Application

The preferred point of application of the chlorinating agent is at the beginning of the pipe line extension or any valved section of it, and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine-bearing water into the pipe shall be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipe line extension. Alternate points of applications may be used when approved or directed by the City.

31.14.06 Chlorinating Valves and Hydrants

In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be chlorinated while the pipe line is filled with the chlorinating agent and under normal operating pressure.

31.14.07 Operation of City Valves

Valves shall be manipulated by the City personnel so that the strong chlorine solution in the line being treated shall not flow back into the line supplying the water.

31.14.08 Retention Period

Treated water shall be retained in the pipe at least 24 hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least 25 mg/l.

31.14.09 Final Flushing and Testing

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its lengths shows upon test, a free chlorine residual not in excess of that normally carried in the system. Flushed chlorinated water shall be de-chlorinated by an approved method before or during discharge.

After flushing, water samples collected on 2 successive days from the treated piping system, as directed by the FDEP permit, shall show acceptable bacteriological results. All bacteriological testing shall be performed by a certified laboratory or City and paid for by the Contractor. All such bacteriological analysis must be performed by a laboratory certified by the State of Florida.

Proper chain of custody procedures must be followed and samples shall only be collected by certified laboratory personnel in the presence of City personnel.

Copies of testing results and all related correspondence with the FDEP shall be submitted to the City.

31.14.10 Repetition of Flushing and Testing

Should the initial treatment result in an unsatisfactory bacterial test, the original chlorination procedure shall be repeated by the Contractor until satisfactory results are obtained.

Section 31.15 FIRE HYDRANTS

31.15.01 Material

Fire hydrants shall have a minimum 5¼ inch valve opening and shall comply with AWWA Standard C-502 for fire hydrants for water works service, unless in conflict with Manual, in which case this Manual shall apply. Each hydrant shall have 6 inch mechanical joint ends with harnessing lugs (“dog ears”) and shall open by turning to the left (counter-clockwise). Fire hydrant shall be of ample length for a minimum 3½ foot depth of bury. It shall be provided with two 2½ inch hose nozzles and one 4½ inch pumper nozzle, all having National Standard hose threads. Nozzles shall have caps attached by chains. Operating nuts shall be AWWA Standard (pentagonal, measuring 1½ inch point to flat). Fire hydrants shall be equipped with O-Ring packing. (See approved Manufacturer's List attached as part of this Manual.)

31.15.02 Painting

All iron parts of the hydrant, both inside and outside, shall be painted in accordance with AWWA C-502. All inside surfaces and outside surfaces below the ground line shall be coated with asphalt varnish. They shall be covered with 2 coats, the first having dried thoroughly before the second is applied. The outside of the hydrant above the furnished ground line shall be thoroughly cleaned and thereafter painted with 1 coat of paint of a durable composition, Hydrant Green for bonnet and Hydrant Yellow for body. Products shall be as identified in the Approved Manufacturer List.

31.15.03 Construction Details

Hydrants shall be plumb and shall be set so that the lowest hose connection is, at least, 18 inches above the surrounding finished grade. All hydrants shall be inspected in the field upon delivery to the job to insure proper operation before installation. The resetting, moving, and reconnecting of existing hydrants shall be handled in a manner similar to a new installation. Hydrant shall be constructed as specified in the Typical City Details attached as part of this Manual. Fire hydrants shall be required to have approved restraint glands.

31.15.04 Location and Spacing

Fire hydrants shall be as specified in the Typical City Details attached as part of this Manual. The Fire Chief or his Designee shall review the actual placement locations and final field locations of all hydrants. Hydrants shall be located no less than 5 and no more than 10 feet from the edge of pavement of the adjacent roadway and no less than 5 feet away from any physical feature which may obstruct access or view of any hydrant unless otherwise approved by the City. Hydrants shall not be placed on private distribution systems unless specifically approved in writing by the City of Ocoee Fire Rescue Department. Hydrants shall be within a right-of-way or an easement.

Hydrants shall be spaced and installed according to the following schedule in all buildings falling under the LDC regulations, unless specifically permitted by City to do otherwise

- A) Single-Family Residential sprinklered and non-sprinklered:
 - 1) 500 feet between hydrants.
 - 2) No building further than 250 feet from a hydrant.
- B) All other non-sprinklered and sprinklered (commercial, multifamily or industrial areas)
 - 1) 350 feet between hydrants.
 - 2) No building further than 200 feet from a hydrant.
- C) These areas may require additional hydrants due to required fire flows.

Section 31.16 CROSS CONNECTION CONTROL

In order to protect the public water supply system from contamination due to cross connections, the Developer shall install City approved backflow prevention devices where there is the potential of a non potable substance or contamination coming into contact with the public water system. All backflow prevention devices shall comply with the City of Ocoee's Manual of Cross Connection Control and the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California (FCCCHR).

ARTICLE 32

RECLAIMED WATER SYSTEM

Index	32.01 <u>GENERAL CONSIDERATIONS</u>
	32.02 <u>DESIGN BASIS</u>
	32.03 <u>DETAILS OF DESIGN AND CONSTRUCTION</u>
	32.04 <u>RECLAIM METERING</u>
	32.05 <u>RECLAIM SERVICES AND CONNECTIONS</u>
	32.06 <u>SERVICE PIPE, STOPS, FITTINGS, AND SERVICE SADDLES</u>
	32.07 <u>RECLAIM MAIN MATERIALS</u>
	32.08 <u>RECLAIM MAIN INSTALLATION</u>
	32.09 <u>VALVE INSTALLATION</u>
	32.10 <u>IDENTIFICATION</u>
	32.11 <u>SEPARATION OF WATER MAINS AND SEWERS</u>
	32.12 <u>TRENCH PREPARATION AND PIPE BEDDING</u>
	32.13 <u>HYDROSTATIC TESTS</u>
	32.14 <u>FINAL FLUSHING</u>
	32.15 <u>SYSTEM BLOWOFFS AND SUPPLY HYDRANT</u>

[BACK TO TABLE OF CONTENTS](#)

Section	32.01	<u>GENERAL CONSIDERATIONS</u>
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32.01.01	<u>Types of Reclaim Water Supply Mains</u>
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The City will approve plans for reclaim water supply mains and extensions (herein this article referred to as “reclaim mains”) only when such mains are designed and constructed in accordance with the criteria set forth in this Manual.

32.01.02	<u>Design Period</u>
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Reclaim mains shall be designed for the estimated ultimate tributary population, as derived for the City’s approved future land uses and/or historical flows. Reclaim mains shall not include considerations for flows for fire protection demand and shall be subject to system or area shut downs. In the event the latest edition of an approved City of Ocoee Reclaim Master Plan or Study identifies components of the reclaim system that are under consideration, the largest capacity consideration shall be used in the design.

32.01.03 Location

Reclaim mains shall be located in dedicated rights-of-way or utility easements. When installed in rights-of-way, reclaim mains shall, in general, maintain a consistent alignment with respect to the centerline of the road. All reclaim mains located outside of dedicated rights-of-way shall require a minimum 20-foot easement. If a reclaim water main is located adjacent to a right-of-way, a minimum 10-foot easement shall be provided. Additional easement widths shall be provided when the pipe size or depth of cover so dictates. Reclaim mains shall not be placed under retention ponds, tennis courts, and other structures or within 75 feet of public or private potable water supply wells. In general, reclaim mains shall not be located alongside rear lot lines or pond berms unless approved by the City.

Section 32.02 DESIGN BASIS

32.02.01 Average Daily Flow and Peak Flow

Reclaim peak hourly flow shall be used as the design basis for the neighborhood and commercial (local) reclaim systems. Reclaim peak-hour flow shall be based on the application of a 1" depth of irrigation per week applied over two days a week from 5 P.M. to 7 A.M. (15 hours), multiplied by a factor of safety. The factor of safety shall be 3 divided by any alternating irrigation days per address for the area to be serviced.

32.02.02 Reclaim System Hydraulic Modeling

The City of Ocoee maintains a reclaim hydraulic model (Bentley WaterCAD) which is used for but not limited to determining system performances, offsite impacts and residual times. For developments that may substantially add to or impact the City's reclaim system, the Owner/Developer shall initiate the incorporation of the development's elements into the City's model, and the simulation/analysis of the model. Unacceptable operating conditions and/or offsite impacts created by the proposed development shall be remediated by the Owner/Developer.

This effort to be undertaken by the Owner/Developer can be accomplished by either the developer's engineer performing the model work with a City review or by electing to have the City undertake the work. Electing to have the City to perform the work shall require City approval. All costs incurred by the incorporation of and outside reviews by the City shall be at the Owner/Developer's expense. All final products shall become property of the City.

Section 32.03 DETAILS OF DESIGN AND CONSTRUCTION

32.03.01 Pressure

All reclaim mains shall be designed in accordance with Section 30.02.01 above. The system shall be designed to maintain a minimum pressure of 40 psi 98% of the time. The normal working pressure in the distribution system should be approximately 60 psi. For pressures points greater than 90 psi, special provisions may be required. Design Friction Losses for reclaim mains shall be determined using the Hazen-Williams friction coefficient of C=120. Peak flow shall not exceed 5 fps.

32.03.02 Diameter

Only 4", 6", 8", 12", 16", 20", 24", 30", 36", 42", 48" and 54" diameter reclaim mains shall be permitted. Reclaim mains with a 4" diameter shall be permitted in cul-de-sac areas with a maximum length of 800 feet of pipe. As a minimum, 6" looped systems shall be required in low density residential projects. Where looping of mains is not practical, 8" minimum mains shall be required, unless detailed calculations are submitted to substantiate the sufficiency of a 6" main. In commercial, industrial, and high density residential areas, minimum 8" looped mains shall be required.

32.03.03 Dead Ends

In order to provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins wherever practical, as determined by the City. System looping is required wherever possible to increase overall capacity and service. Where dead-end mains occur, they shall be provided with a hydrant or if approved blow-off for flushing purposes. Flushing devices shall be sized to provide flows which will give a velocity of at least 2.5 feet per second in the reclaim main being flushed. No flushing device shall be directly connected to any sewer.

32.03.04 Valves

Valves shall be provided for all branch connections, loop ends, fire hydrant stubs, or other locations as required to provide an operable, easily maintained, and repairable reclaim distribution system. Valves are to be placed so that the maximum allowable length of reclaim main required to be shut down for repair work shall be 500 feet in commercial, industrial or multi-family residential areas, or 800 feet in other areas.

32.03.05 Air Relief Valves

At high points in reclaim mains where air can accumulate, provisions shall be made to remove the air by means of hydrants or automatic air relief valves. Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur. Refer to the Typical City Details attached as part of this Manual.

32.03.06 Chamber Drainage

Chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system shall not be connected directly to any storm drain or sanitary sewer, nor shall blow-offs or air relief valves be connected directly to any sewer.

Section **32.04 RECLAIM METERING**

32.04.01 General

All reclaim service connections shall be metered. In general, the method of metering shall follow the guidelines listed below. However, the Owner's/Developer's Engineer must obtain approval before finalizing the design of the metering system. Master metering for irrigation for common grounds shall be reviewed and approved by the City Engineer on a case-by-case basis.

32.04.02 Single Family, Duplex, and Multi-Family Subdivisions

Each unit's private irrigation areas shall be individually metered. Joint common irrigation areas shall be master metered. Single and double services shall be installed at property lines as specified in the Typical City Details attached as part of this Manual.

32.04.03 Commercial, Industrial, and Institutional Projects

In general, each building shall be individually metered. Meter(s) shall be located in the public rights-of-way at the property line.

32.04.04 Shopping Centers

Common irrigation areas shall be master metered. Each unit's private irrigation area shall be individually metered. The meters shall be located either in the right-of-way or within a Utility Easement. The meters shall be located within an unpaved area to facilitate removal, repair and/or replacement without damage to paved surfaces.

32.04.05 Meter Installation

All meter boxes shall be installed by the Contractor at finished grade and level. All meters 2" in size and smaller will be installed by the City after payment of applicable fees and charges. All meters 2" in size and smaller shall be installed underground in an approved meter box. Meters larger than 2" shall be installed aboveground. In general, meters larger than 2" shall be located in a meter easement located adjacent to the public right-of-way.

32.04.06 Meter Sizing

Size of all meters shall be determined by the Owner's/Developer's Engineer and approved by the City Engineer. The Owner's/Developer's Engineer shall provide sufficient information on estimated peak flows and low flows so that meter size can be evaluated. The Owner's/Developer's Engineer shall include head-losses through metering device when designing the reclaim system.

Section 32.05 RECLAIM SERVICES AND CONNECTIONS

Reclaim services and connections shall conform to the applicable provisions of this Manual and the Typical City Details attached as part of this Manual. Only 1", 1 ½", 2", 3", 4", 6", 8", 10" and 12" services shall be permitted. Where reclaim services greater than 12" are required, dual services shall be provided. New services and connections to the reclaim system, either new or existing, shall be made by the Contractor.

Reclaim service piping and connection shall be installed as specified in the Typical City Details attached as part of this Manual. The location of all service lines shall be as specified in the Typical City Details attached as part of this Manual and shall be either single or dual service. On curbed streets, the exact location for each installed service shall be marked by etching or cutting a "W" in the concrete curb. Where no curb exists, locations shall be adequately marked by a method approved by the City.

Section 32.06 SERVICE PIPES, STOPS, FITTINGS, AND SERVICE SADDLES

32.06.01 Service Pipes

All service lines shall be 1", 1 ½" or 2" standard AWWA C-901-88 PE 3406 (purple) polyethylene tubing, 200 psi rating. Single and double residential service lines shall be 1" diameter. Double service lines shall use 1" x 1" x 1" wye branch (Ford No. Y44-264) or equivalent.

32.06.02 Stops

Corporation stops shall be 1", 1 ½" or 2" brass, equipped with connections compatible with polyethylene tubing and threaded in accordance with specifications in AWWA C-800 and AWWA C-901. Curb stops shall be sized to match the meter size and conform to the specifications in AWWA C-800 and AWWA C-901.

32.06.03 Fittings

Fittings shall be brass, cast and machined in accordance with specifications in AWWA C-800 and AWWA C-901, with compatible polyethylene tubing connections.

32.06.04 Service Saddles

A service saddle may be used for all service line taps. Service saddles shall be double strap, anchored by a minimum 4 bolt pattern on a ductile iron saddle body. The City may require a stainless steel strap and fusion epoxy or nylon coated ductile iron body with stainless steel hardware in areas designated as corrosive.

Section 32.07 RECLAIM MAIN MATERIALS

32.07.01 General

These Specifications cover the pipe, fittings, and accessory items used for reclaim distribution systems.

Pipe used in reclaim distribution systems shall be generally Polyvinyl Chloride Pipe (PVC) with direct burial applications. For directional drill applications High Density Polyethylene Pipe (HDPE) shall be required.

The Contractor shall be responsible for all materials furnished and storage of same, until the date of substantial completion. The Contractor shall replace, at the Contractor's expense, all materials found to be defective or damaged in handling or storage. The Contractor shall, if requested by the City, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

32.07.02 Pipe Material

All PVC mains of nominal diameter 4" through 12" shall be AWWA C900 SDR18 and mains greater than 12" shall be C905 SCR18. Refer to ARTICLE 33 Horizontal Directional Drilling for HDPE material requirements.

32.07.03 Fittings

Any fittings required shall be mechanical joint ductile iron or gray iron conforming to ANSI/AWWA A-21.10/C-110, 250 psi minimum pressure rating, or ductile iron compact fittings 4" through 12" in accordance with ANSI/AWWA A-21.53/C-153.

32.07.04 Joints

Joints for ductile iron pipe and fitting joints shall be push-on or mechanical joints conforming to ANSI/AWWA A-21.11/C-111. Where called for in the plans, restrained or flanged joints shall be provided. Flanged joints shall conform to ANSI Standard B-16.1-125 lb. Restrained joints shall conform to ARTICLE 26 of this Manual.

32.07.05 Resilient Seat Gate Valves

All gate valves 12" and smaller shall be resilient seat gate valves. Such valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C-509, latest revision, and in accordance with the following Specifications. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve. (See approved Manufacturer's List attached as part of this Manual.)

The valve body, bonnet, and bonnet cover shall be cast iron ASTM A-126, Class B. All ferrous surfaces inside and outside shall have a fusion-bonded epoxy coating. A 2" wrench nut shall be provided for operating the valve. All valves are to be tested in strict accordance with AWWA C-509. The valve shall be operated opening counterclockwise.

The valves shall be non-rising stem with the stem made of cast, forged, or rolled bronze as specified in AWWA C-509. Two stem seals shall be provided and shall be of the O-ring type. The stem nut must be independent of the gate.

The resilient sealing mechanism shall provide zero leakage at the working pressure when installed with the line flow in either direction.

All shut-off valves 16" and larger shall be resilient seat gate with horizontal mechanical gearing and clear passage for pigging devices. Valve shall be American Flow Control Series 2500 NRS "Bevel Gearing Dimensions" or equal.

32.07.06 Valve Boxes

All buried valves shall have cast-iron three-piece valve boxes. Valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at, or slightly above, the finished grade surface as directed by the City. The barrel shall be a 2-piece, sliding type, having 5¼" shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall be 5¼" square and shall have "RECLAIM" cast into the top for all reclaim mains. The actuating nuts for deeper valves shall be extended to come up to a 4' depth below finished grade.

Care shall be taken while constructing valve boxes to ensure that valve stems are vertical and the cast iron box has been placed over the stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Contractor shall remove any sand or undesirable fill from valve box prior to final inspection.

32.07.07 Air Release Valves

The air release valves for use in reclaim mains shall be installed as specified in the Typical City Details attached as part of this Manual and the make and model per the approved Manufacturer's List. Valves shall be provided with a vacuum check to prevent air from reentering the line. The fittings shall be threaded.

Section **32.08** **RECLAIM MAIN INSTALLATION**

32.08.01 General

Pipe shall be installed in accordance with the manufacturer's specifications and instructions for the type of pipe used and applicable AWWA Standards, such as C-600 and C-603, unless otherwise stated in these Specifications. A 2" jumper connection shall be provided for purposes of filling and testing the installed reclaim line prior to clearance for use. The jumper is to be installed per the Typical City Details attached as part of this Manual.

32.08.02 Pipe Storage and Staging

All types of pipe shall be handled in such a manner as will prevent damage to the pipe or coating. Accidental damage to pipe or coating shall be repaired to the satisfaction of the City or be removed from the job. When not being handled, the pipe shall be supported on timber cradles or on properly prepared ground, graded to eliminate all rock points and to provide uniform support along the full length. When being transported, the pipe shall be supported at all times in a manner which will not permit distortion or damage to the lining or coating. Any unit of pipe that, in the opinion of the City, is damaged beyond repair by the Contractor shall be removed from the site of the work and replaced with another unit. Joint gaskets shall be stored in a clean, dark, dry location until immediately before use.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned and re-laid. At times when pipe-laying is not in progress, the open ends of the pipe shall be closed by a water-tight plug or by other means approved by the City to ensure absolute cleanliness inside the pipe.

Section 32.09 VALVE INSTALLATION

All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the City before they are installed. Valves shall be installed in a vertical position and be provided with a standard valve box so arranged that no shock will be transmitted to the valve. The box shall be vertically centered over the operating nut, and the cast iron box cover shall be set flush with the road bed or finished surface. After installation, all valves shall be subjected to the field test for piping as outlined in these Specifications. Should any defects in materials or workmanship appear during these tests, the Contractor shall correct such defects to the satisfaction of the City.

Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion-resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All buried bolts and nuts shall be heavily coated with 2 coats of bituminous paint.

Section 32.10 IDENTIFICATION

In order to preclude possible interconnections and/or improper use of reclaim water, all reclaim lines, tubing, meter boxes and locate wire/tape shall be purple Pantone 522c in color. PVC or HDPE reclaim mains shall be marked with a continuous stripe within the top 90° of the pipe. Said stripe shall be a minimum of 2" in width and shall be light purple in color. Backfill shall not be placed for 30 minutes if field painting is required. In addition, all pipe shall be buried with identification tape above the top of the pipe, see the Typical City Details attached as part of this Manual. The tape shall indicate the presence of the reclaim main plainly on the tape face. Indicator tape buried with PVC pipe shall be able to be detected by standard metal detection equipment.

All new reclaim usages shall include the proper placement of signage notifying the public of the use of reclaim. Subdivisions shall require signs located at each entrance and all common/landscape areas. Commercial sites shall have signs located where public could come in contact with reclaim water. See Typical City Details as part of this Manual for sign details.

Section 32.11 SEPARATION OF WATER MAINS AND SEWERS

32.11.01 General

No reclaim main shall pass through or come in contact with any part of a sewer manhole. Individual septic tanks must be located and avoided. Reclaim mains shall be laid such as to ensure no cross-connection, line confusion and/or improper connection will occur with potable water mains and facilities. Water main shall have a minimum of 3' vertical and 18" horizontal separation, outside to outside, or the separation requirements of F.A.C. Rule 62-555.314 shall be met as a minimum, whichever is greater.

Section 32.12 TRENCH PREPARATION AND PIPE BEDDING

32.12.01 Trench Preparation and Pipe Bedding

Applicable provisions of ARTICLE 6 of this Manual shall apply. Also refer to the Typical City Details attached as part of this Manual.

32.12.02 Pipe Preparation, Handling and Laying

All pipe and fittings shall be inspected prior to lowering into trench to ensure no cracked, broken, or otherwise defective materials are being used. Contractor shall clean ends of pipe thoroughly and remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

Contractor shall use proper implements, tools, and facilities for the safe and proper protection of the work. Contractor shall lower pipe into the trench in such a manner as to avoid any physical damage to the pipe and shall remove all damaged pipe from the job site. Care shall be taken to not drop or dump pipe into trenches under any circumstances.

Contractor shall prevent foreign material from entering the pipe while it is being placed in the trench. Contractor shall remove all foreign material from the pipe or joint ring before the next pipe is placed. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into the pipe, the City may require that snugly-fitted, tightly-woven canvas bags be placed over each end before lowering the pipe. The bags shall be left in place until the connection is to be made to the adjacent pipe. During laying operations, Contractor shall keep debris, tools, clothing, or other materials out of the pipe.

All pipe shall be installed in accordance with AWWA C-600 unless such Standards conflicts with this Manual, in which case this Manual shall apply. Contractor shall cut pipe only as necessary to comply with alignment shown on the plans. Flame cutting of pipe shall not be allowed. Contractor shall provide special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes shall be permitted under any circumstances.

32.12.03 Trench Dewatering and Drainage Control

Contractor shall prevent water from entering the trench during excavation and pipe laying operations to the extent required to properly grade the bottom of the trench and allow for proper compaction of the backfill. Pipe shall not be laid in water.

32.12.04 Survey Line and Grade

Pipe shall be laid to the lines and grades shown on the plans. The Contractor shall provide line and grade stakes at a 100' maximum spacing and at all lines and/or grade change locations. Contractor shall provide Temporary Bench Marks at maximum 1,000' intervals. The minimum pipe depth shall be 3' below the finished grade surface or 3' below the elevation of the edge of pavement of the road surface, whichever is greater.

32.12.05 Laying of Pipes on Curves

Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints. Maximum deflections at pipe joints and laying radius for the various pipe lengths shall be as recommended by the pipe manufacturer.

32.12.06 Pipe Restraining and Thrust Block

Requirements specified in ARTICLE 26 of this Manual shall apply.

32.12.07 Bedding and Backfill for Pipes

Requirements specified in ARTICLE 6 of this Manual shall apply.

Section 32.13 HYDROSTATIC TESTS

32.13.01 General

Hydrostatic tests shall consist of pressure test and leakage tests. Hydrostatic tests shall be conducted on all newly laid pressure pipes, joints and valves including all service lines to the curb stops. Air testing of pressure pipes shall not be permitted under any circumstances. Tests shall not be made on sections exceeding 2,000'. Contractor shall furnish all necessary equipment and material, make all taps, and furnish all closure pieces in the pipe as required. Equipment to be furnished by the Contractor shall include graduated containers, pressure gauges, hydraulic force pumps, and suitable hoses and piping. The City will monitor and approve a satisfactory test.

The Contractor may conduct hydrostatic tests after the trench has been partially backfilled with the joints left exposed for inspection for informational purposes only. The hydrostatic tests for acceptance shall only be conducted after the trenches have been completely backfilled and compacted as specified. Where any section of pipe is provided with concrete thrust blocking, pressure tests shall not be made until at least 5 days have elapsed after the thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be reduced to 24 hours if the City concurs that the concrete has cured and reached adequate strength.

32.13.02 Testing Criteria

All pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of 150 psi. The duration of each pressure test shall be for a period of 2 hours. If during the test, the integrity of the tested line is in question, the City may require a 6 hour pressure test. The basic provisions of AWWA C-600 shall be applicable.

32.13.03 Procedure for Pressure Test

Each section of pipe to be tested, as determined by the City, shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made and appropriate valves installed to ensure bleeding of all air from the main. If defective pipes, fittings, valves, or hydrants are discovered in consequence of this pressure test, all such items shall be removed and replaced by the Contractor with sound material and the test shall be repeated until satisfactory results are obtained. Provisions of AWWA C-600, where applicable, shall apply.

32.13.04 Procedure for Leakage Test

After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. Applicable provisions of AWWA C-600 shall apply.

Allowable leakage in gallons per hour for pipeline shall not be greater than that determined by the formula:

$$L = \frac{SD(p)^{1/2}}{133,200}$$

Note: L = Allowable leakage in gallons per hour.

S = Length of pipe tested, in feet.

D = Nominal diameter of the pipe in inches.

P = Average test pressure during leakage test in pounds per square inch gauge.

Leakage is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under testing, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. Should any of the test pipe laid disclose leakage greater than that allowed, Contractor shall locate and replace or repair the defective joints, pipe or valve until the leakage from subsequent testing is within the specified allowance.

Section 32.14 FINAL FLUSHING AND TESTING

All material, sediment and debris shall be thoroughly removed from the newly laid pipe at its extremity until the replacement water throughout its length is clear, including all mains and services. Repeating of the cleaning procedures shall be required in the event that material, sediment and/or debris is observed or system continuity is interrupted.

32.14.01 Pigging/Swabbing Procedures

- a. All new reclaimed water mains shall be hydraulically or pneumatically cleaned with a polypropylene swabbing device to remove dirt, sand, and debris from main.
- b. If swabbing access and egress points are not provided in the design drawings, it will be the responsibility of the CONTRACTOR to provide temporary access and egress points as required for the cleaning.
- c. Passage of cleaning poly swabs through the system shall be constantly monitored, controlled and all poly swabs entered into the system shall be individually marked and identified so that the exiting of the poly swabs from the system can be confirmed.
- d. Cleaning of the system shall be done in conjunction with the initial filling of the system for its hydrostatic test.
- e. The CONTRACTOR shall insert flexible polyurethane foam “swabs” (2 pounds per cubic foot density) complete with rear polyurethane drive seal, into the first section of pipe. The “swabs” shall remain there until the pipeline construction is completed.
- f. The line to be cleaned shall only be connected to the existing distribution system at a single connection point.
- g. Locate and open all new in-line valves beyond the point of connection on the pipeline to be cleaned during the swabbing operation.
- h. At the receiver or exit point for the poly swab, the CONTRACTOR is responsible for creating a safe environment for collection of debris, water and the swab. Considerations shall be made for protecting surrounding personnel and property and safe retrieval of the swab.
- i. Only City personnel shall operate the supply valve from the existing distribution system. Cleaning and flushing shall be accomplished by propelling the swabbing swab down the pipeline to the exit point. Flushing shall continue until the water is completely clear and swab is retrieved.
 1. Re-apply a series of individual swabs in varying diameters and/or densities as required, to attain proper cleanliness of pipeline.

2. Swabbing speed shall range between two and five feet per second.

j. After the swabbing process, pressure testing of the pipe shall be completed in accordance with this ARTICLE.

Section 32.15 SYSTEM BLOWOFFS AND SUPPLY HYDRANT

32.15.01 Spacing

System blow offs shall be required on each reclaim main run with a maximum spacing of 3,000'. Where reclaim mains are 12" or greater, or system blow offs are at extreme ends of the reclaim system, the system blow off shall be replaced with supply hydrants. The City Engineer shall approve the replacement of a system blow off with supply hydrant. Fire hydrants as specified in ARTICLE 31 shall be used as supply hydrants and shall be painted purple.

ARTICLE 33

HORIZONTAL DIRECTIONAL DRILLING

Index	33.01	<u>GENERAL CONSIDERATIONS</u>
	33.02	<u>DESIGN BASIS</u>
	33.03	<u>DETAILS OF DESIGN AND CONSTRUCTION</u>
	33.04	<u>PRODUCTS</u>
	33.05	<u>EXECUTION</u>

[BACK TO TABLE OF CONTENTS](#)

Section	33.01	<u>GENERAL CONSIDERATIONS</u>
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33.01.01	<u>Type of Horizontal Installation</u>
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The City will approve plans for horizontal directional drill installation of pipe and /or casing pipe for utility extensions as required for crossing under roadways, rail lines, streams, or other vertical conflicts as necessary in accordance with approved design and recommendation of the Engineer of Record. Such installations may be required to meet minimum standards as set forth by other jurisdictions having authority over the feature being crossed including Orange County, FDOT, or Railroad. The utility mains and extensions shall be installed in conjunction with the horizontal drilling only when such mains are designed and constructed in accordance with the criteria set forth in other Articles of this Manual.

Section	33.02	<u>DESIGN BASIS</u>
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33.02.01	<u>General</u>
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- A. Horizontal directional drilling is a method of installation commonly referred to as directional drilling or guided horizontal boring.
- B. Refer to applicable water, reclaimed water and force main design standards in ARTICLE 29, ARTICLE 31, and ARTICLE 32.

33.02.02	<u>Location</u>
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- A. Directional drilling is allowed for pressurized mains and is not allowed for gravity mains.
- B. Directional drilling of restrained PVC and ductile iron is allowed in City of Ocoee right-of-way. Ductile iron shall only be utilized for water and reclaimed water mains.

- C. Directional drilling of HDPE pipe shall be limited to wetlands, canal crossings and road crossings as approved by the City Engineer. The City will consider allowing directional drilling for other circumstances with specific approval, such as limited R/W or easement areas that conventional open cut cannot be performed due to other utilities or conflicts. A written request must be submitted to the City that outlines the need for directional drilling.

Section 33.03 DETAILS OF DESIGN AND CONSTRUCTION

33.03.01 General

- A. Horizontal alignment shall be as shown on the PLANS. The pipe shall have a minimum 36 inches of cover.
- B. The maximum depth shall be determined based on the size of the drill and the necessary clearance from the existing or proposed utilities or feature being crossed.
- C. For subaqueous crossings, a minimum cover of five feet shall be maintained over the pipe measured from the lowest part of the stream bed at the point of crossing.
- D. Compound curvatures may be used, but shall not exceed the maximum deflections, as set forth by the pipe manufacturer or AWWA Standards, whichever is more stringent.
- E. Entry angle shall not exceed 15 degrees. Exit angle shall be 6 to 12 degrees to facilitate pullback. Entry angle and exit angle shall not exceed manufacturer recommendations on deflection, angle or radius of curvature.
- F. A cross section drawn to scale shall be provided on the PLANS showing the proposed bore path and all existing utilities within the directional drill corridor.

33.03.02 Scope of Work

The WORK specified in this section consists of furnishing and installing underground utilities using the horizontal directional drilling (HDD) method of installation, also commonly referred to as directional boring or guided horizontal boring for pressure pipe. This WORK shall include all piping services, equipment, materials and labor for the complete and proper installation testing, restoration of underground utilities and environmental protection and restoration.

33.03.03 Quality Assurance

A. Qualifications:

1. Directional drilling CONTRACTOR (or SUBCONTRACTOR) shall have a minimum of four years experience constructing water, wastewater, or reclaimed water experience to include pipelines of the same or larger diameter and the same or greater lengths. All pipe and appurtenances of similar type and material shall be furnished by a single manufacturer.
2. The CONTRACTOR's operations shall be in conformance with the Directional Crossing Contractors Association (DCCA) published guidelines (latest edition) and pipe manufacturer's guidelines and recommendations.

Section 33.04 PRODUCTS

33.04.01 General

A. The directional drilling equipment shall consist of the following:

1. A directional drilling rig of sufficient capacity to perform the bore and pull-back of the pipe;
2. A drilling fluid mixing, delivery and recovery system of sufficient capacity to complete the crossing;
3. A drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be reused;
4. A magnetic guidance system to accurately guide boring operations,
5. A vacuum truck of sufficient capacity to handle the drilling fluid volume; and
6. Trained and competent personnel to operate the system.

B. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in proper working order.

33.04.02 Drilling System

The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pullback pressure during pullback operations. The rig shall be grounded during drilling and pullback operations. There shall be a system to detect electrical current from the drilling string and an audible alarm that automatically sounds when an electrical current is detected.

33.04.03 Pipe

A. Pipe shall be HDPE pipe with ductile iron pipe outside diameters in accordance with AWWA C900 (C905) or C906 respectively. The dimension ratio shall be verified by the CONTRACTOR based on the pipe, joint and material pull strength required for the directional drilling. Alternate material such as PVC or DIP may be allowed in special circumstances and must be approved by the City Engineer. Alternate material shall comply with specification as outlined by this manual and other conditions as required by approval by the City Engineer.

B. HDPE Pipe

1. HDPE pipe and related fittings shall be made with prime virgin resins exhibiting a minimum cell classification as defined in ASTM D3350 and meeting the PE 3408 code designation with maximum dimension ratios equal to the following.

Table 33-1. Maximum Dimension Ratios for HDPE Pipe.	
Type of Pipe System	Maximum Dimension Ratio
Wastewater	11
Reclaimed Water	11
Water	11

2. HDPE pipe 4-inch and larger nominal diameter shall be joined by means of zero leak-rate butt (thermal heat) fusion welds and/or approved flanged joints. Joints shall provide axial pullout resistance. Compression style fittings shall not be allowed. Pipe shall meet the requirements of ANSI/AWWA C906, and have an outside diameter dimension of ductile iron pipe. Flanged joints shall not be used below finished grade for horizontal directional drilling applications.

3. HDPE pipe shall have been continuously marked by the manufacturer with permanent printing indicating at a minimum the following.
 - a. Nominal size (inches);
 - b. Dimension ratio (DR);
 - c. Pressure rating (psi);
 - d. Trade name;
 - e. Material classification (PE 3408);
 - f. Plant, extruder and operator codes;
 - g. Resin supplier code;
 - h. Date produced; and
 - i. HDPE pipe used for portable water mains shall bear the NSF Seal of Approval.
4. HDPE pipe shall be black in color with permanent colored stripes extruded into the pipe length or shall be one solid color, per the applicable service.

Table 33-2. Pipe Color.	
Pipe Use	Color Coding
Potable Water	Blue
Wastewater	Green
Reclaimed Water	Purple

5. Installation Curvature:

The pipeline curvature shall not have a radius less than as shown in Table 33-3, or exceed the manufacturers suggested minimum bending radius.

Table 33-3. HDPE Pipe Deflection Information.		
Pipe Diameter (inches)	Minimum Radius of Curvature (feet)	Offset per 20-ft Length (inches)
4	23	9.3
6	34	6.1
8	44	4.6
10	56	3.5
12	67	3.0
16	88	2.3

33.04.04 Drilling Fluids

Drilling fluids shall consist of a mixture of potable water and gel-forming colloidal material, such as bentonite or a polymer surfactant mixture producing slurry of a consistency sufficient to expedite the pull-back installation within the standards of practice detailed in the DCCA guidelines, (latest edition).

Section 33.05 EXECUTION

33.05.01 Personnel Requirements

- A. Responsible representatives of the CONTRACTOR and SUBCONTRACTOR(s) shall be present at all times during directional drilling operations. A responsible representative as specified herein is defined as a person experienced in the type of WORK being performed and who has the authority to represent the CONTRACTOR in a routine decision making capacity concerning the manner and method of carrying out the WORK.
- B. The CONTRACTOR and SUBCONTRACTOR(s) shall have sufficient number of competent workers on the project at all times to ensure the utility placement is made in a timely, satisfactory manner. Adequate personnel for carrying out all phases of the directional drilling operation (where applicable: tunneling system operators, operator for removing spoil material, and laborers as necessary for various related tasks) must be on the job site at the beginning of WORK. A competent and experienced supervisor representing the CONTRACTOR or SUBCONTRACTOR that is thoroughly familiar with the equipment and type of WORK to be performed, must be in direct charge and control of the operation at all times. In all cases, the supervisor must be continually present at the project site during the directional drilling operation.

33.05.02 Work Plan

A. Work Plan: Prior to beginning WORK, the CONTRACTOR must submit a Work Plan to The City Engineer detailing the procedure and schedule to be used to execute the project. The WORK plan should include the following.

- 1. A description of all equipment to be used;
- 2. Down-hole tools;
- 3. A list of personnel and their qualifications and experience;
- 4. List of SUBCONTRACTORS;
- 5. A schedule WORK activity;
- 6. A safety plan, traffic control plan (if applicable);
- 7. An environmental protection plan and;
- 8. Contingency PLANS for possible problems.

WORK plan should be comprehensive, realistic and based on actual working conditions for this particular project. Plan should document the requirements to complete the project.

B. Equipment:

1. The CONTRACTOR will submit specifications on directional drilling equipment to be used to ensure that the equipment will be adequate to complete the project. Equipment shall include but not be limited to the following.
 - a. Drilling rig;
 - b. Mud system;
 - c. Mud motors (if applicable);
 - d. Down-hole tools;
 - e. Guidance system and;
 - f. Rig safety systems.
2. Calibration records for guidance equipment shall be included. Specifications for any drilling fluid additives that the CONTRACTOR intends to use or might use shall be submitted.

33.05.03 Coordination of the Work

- A. The CONTRACTOR shall notify the City Engineer at least three days in advance of starting WORK. In addition, the actual crossing operation shall not begin until An engineering representative is present at the project site and agrees that proper preparations for the crossing have been made. City Engineer's approval for beginning the crossing shall in no way relieve the CONTRACTOR from the ultimate responsibility for the completion of the WORK.
- B. The CONTRACTOR and the City Engineer shall select a mutually convenient time for the crossing operation to begin in order to avoid schedule conflicts.

33.05.04 Procedure

The installation of appropriate safety and warning devices in accordance with the "FDOT Manual on Traffic Control and Safe Practices" shall be completed prior to beginning WORK.

33.05.05 Installation

- A. Erosion and sedimentation control measures and on-site containers shall be installed to prevent drilling mud from spilling out of entry and/or exit pits. Drilling mud will be disposed of off-site in accordance with local, state and federal requirements and/or permit conditions.
 1. No other chemicals or polymer surfactant shall be used in the drilling fluid without written consent of the City Engineer and after a determination is made that the chemicals to be added are not harmful or corrosive to the facility and are environmentally safe.

B. Pilot Hole:

Pilot hole shall be drilled on bore path with no deviations greater than two percent of depth over a length of 100 feet. In the event that pilot does deviate from bore path more than two percent of depth in 100 feet, the CONTRACTOR will notify ENGINEER. The ENGINEER may require the CONTRACTOR to pull-back and re-drill from the location along bore path before the deviation.

C. Reaming:

Upon successful completion of pilot hole, the CONTRACTOR will ream borehole to a minimum of 25 percent greater than outside diameter of pipe using the appropriate tools. CONTRACTOR will not attempt to ream at one time more than the drilling equipment and mud system are designed to safely handle.

D. Pullback:

After successfully reaming borehole to the required diameter, CONTRACTOR will put the pipe through the borehole. In front of the pipe will be a swivel and barrel reamer to compact bore hole walls. Once pullback operations have commenced, operations must continue without interruption until pipe is completely pulled into borehole. During pullback operations, the CONTRACTOR shall not apply more than the maximum safe pipe pull pressure at any time. A break away head rated at the maximum safe pull pressure shall be utilized.

E. As-built variance from the designed bore path shall not exceed plus or minus one foot in the vertical plane and plus or minus two feet in the horizontal plane. The CONTRACTOR shall submit any proposed deviations from the design bore path by submittal to the City Engineer for approval.

F. The pipe entry area shall be graded to provide support for the pipe to allow free movement into the borehole. The pipe shall be guided in the borehole to avoid deformation of, or damage to, the pipe by the use of support rollers, etc.

G. If unexpected subsurface conditions are encountered during the bore, the procedure shall be stopped. The installation shall not continue until the OWNER and ENGINEER have been consulted.

H. The pipe shall be pulled back through the borehole using the wet insertion construction technique. The pipe shall be installed full of water.

I. The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, movement or distortion of surface features.

- J. A boring log shall be kept with horizontal and vertical location every 10 feet. In addition, horizontal location of the bore shall be marked in the field during the bore. The SURVEYOR shall locate these marks and include this information with the bore depths in the Record Drawings. The Surveyor may make a note on the drawing page containing the directional drill and provide an exception for the directional drill only, as the directional drill route cannot be uncovered and physically located. Log should also contain drilling fluid pressure and drilling advancement and pull back rates.
- K. Locating wire shall be attached to the pipe. A minimum of three (3) locating wires shall be attached at different radial locations around the pipe to ensure continuity in at least one wire subsequent to installation. Failure of continuous continuity in the locating wire, at the discretion of the engineering representative, shall result in abandonment and reinstallation of the directional drill.

33.05.06 Field Testing

- A. PVC Pipe:
Perform hydrostatic testing for leakage following installation in accordance with the applicable test sections.
- B. HDPE Pipe:
 - 1. After installation the pipe shall be tested in accordance with the MANUAL with the following modifications:
 - a. Test Duration: The total test time including initial pressurization, initial expansion and time at test pressure, must not exceed eight hours. If the test is not completed due to leakage, equipment failure, etc., the test section shall be depressurized and allowed to “relax” for a minimum of eight hours before it is brought back up to test pressure. The test procedure consists of initial expansion phase and leakage test phase.
 - b. Initial Expansion Phase: During the initial expansion phase, the test section is pressured to the test pressure and enough make-up liquid is added each hour for three hours to return to test pressure.
 - c. Leakage Test Phase: The leakage test phase follows immediately and shall be either two or three hours in duration. At the end of the time test, the test section shall be returned to test pressure by adding a measured amount of liquid. The amount of make-up liquid added shall not exceed the values provided in Table 33-4 plus allowable leakage.

Contractor shall be required to pressure test the HDPE main prior to installation of the main.

Table 33-4. Allowance for Make-up Water Under Test Pressure*								
Test Duration (hours)	Pipe Diameter (inches)							
	2	4	6	8	12	16	20	24
	Allowance/100 feet of Pipeline (gallons)							
2	0.11	0.25	0.60	1.00	2.30	3.30	5.50	8.90
3	0.19	0.40	0.90	1.50	3.40	5.50	8.00	13.30

**Applies to test period and not to initial expansion phase*

C. Pressure Testing:

The test pressure for the pipe shall be 150 psi for water and reclaimed water and 150 psi for wastewater.

D. Mandrel Testing:

Perform mandrel testing through the entire length of the installed pipe. The mandrel size shall be 90 percent of the inside diameter of the pipe.

ARTICLE 34

STORMWATER MANAGEMENT

Index	34.01	<u>GENERAL</u>
	34.02	<u>DESIGN STANDARDS</u>
	34.03	<u>DESIGN STORM (minimum)</u>
	34.04	<u>DRAINAGE AREA GEOMETRY</u>
	34.05	<u>MATERIAL AND DESIGN SPECIFICATIONS</u>
	34.06	<u>FLOOD PRONE AREAS</u>

[BACK TO TABLE OF CONTENTS](#)

Section	34.01	GENERAL
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The purpose of this ARTICLE is to provide design criteria for proposed stormwater management systems within the City of Ocoee. The proposed stormwater management system shall comply with this ARTICLE, the City of Ocoee Comprehensive Plan and City of Ocoee Land Development Code. In addition, while this ARTICLE is intended to be the minimum standard, guidelines and criteria for the design of stormwater management systems in the City of Ocoee, other regulatory agencies and/or government entities by the State statutes or by political boundaries also have jurisdiction. Most of these agencies or government entities have established design criteria for stormwater management. In some cases, established design parameters of those agencies contain conflicting standards or criteria. In the case of conflicting criteria, it is the intent of this ARTICLE to have the most stringent regulations govern. The following agencies and government entities may have jurisdiction within the City of Ocoee:

- St. Johns River Water Management District
- Florida Department of Transportation
- Florida Department of Environmental Protection
- Orange County Environmental Protection Department
- U.S. Army Corps of Engineers
- Federal Emergency Management Agency

Section	34.02	<u>DESIGN STANDARDS</u>
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To comply with the foregoing performance Standards, the proposed stormwater management system shall conform to the following design Standards:

- A) Side slopes and bottoms of all retention areas shall have grass or other landscape material cover. The maximum side slopes of retention areas are given within this ARTICLE. Landscaping of maintenance berms is prohibited unless approved by City Engineer.
- B) Spillways or other entrance channels to retention areas shall be designed to prevent scouring and flushing of these retention areas by heavy rains.

- C) Dry retention systems shall be designed and function such that the Stormwater Quality volume shall be recovered within 3 days (72 hours) in accordance with the SJRWMD criteria. If this is not accomplished by percolation and/or evaporation, the retention area must be improved and approved by the City Engineer to meet the performance requirements. Dry Detention systems are not permitted.
- D) Wet Detention/Retention systems shall be designed to meet the SJRWMD design and performance criteria. If the design CRITERIA is not accomplished following construction, the system must be improved and approved by the City Engineer to meet the performance requirements.
- E) Stormwater Quantity Criteria: Design storms shall consider open or closed basin criteria as provided in Table 34-1.

Table 34-1 Design Storms and Discharge Conditions

Basin	Frequency Duration	Discharge Rates	Discharge Volumes
Open Basin	25-year, 24-hour event	Post ₂₅ less than or equal to Pre ₂₅	Post ₂₅ less than or equal to Pre ₂₅
Closed Basin*	25-year, 24-hour event and 100-year, 24-hour event	Post ₂₅ less than or equal to Pre ₂₅ and Post ₁₀₀ less than or equal to Pre ₁₀₀	Post ₁₀₀ less than or equal to Pre ₁₀₀
Closed Basin with Downstream Flooding**	25-year, 24-hour event and 100-year, 24-hour event	0 cfs	0 cf

* Discharges into land locked lake systems shall not cause a net increase in the Base Flood Elevation estimated by FEMA.

** Downstream flooding is flooding observed and validated by the City Engineer and/or Public Works Director.

- F) Discharge Conditions:
 - (1) All stormwater facilities shall be designed to limit discharges considering open and closed basins per Table 34-1.
 - (2) Discharges shall resemble the pre-predevelopment conditions, matching the pre-development location and does not exceed the pre-development rate and volume.
 - (3) Offsite bypass or discharges from offsite runoff shall be allowed when resembling the pre-development conditions, matching the pre-development location and does not exceed the pre-development rate.

- (4) In closed basins with downstream flooding, existing site conditions/improvements shall be included in the pre-development calculations when following apply:
 - (a) The existing improvements were constructed as part of a land development with a permitted stormwater system or constructed prior to stormwater permitting requirements; and
 - (b) Discharges from the existing improvements are included in the private system designed to receive such discharges or a public system
 - (5) In closed basins with downstream flooding, no adverse impacts are allowed downstream or net increase of the Base Flood Elevation per FEMA.
 - (6) A stormwater outfall structure shall be required for all stormwater management systems not designed to retain the entire 100-year, 24-hour post-development design storm. An emergency overflow structure shall be required for stormwater management systems within all closed basin types.
- G) Stormwater System Recovery:
 - (1) All stormwater facilities shall recover the total volume required to meet the discharge volume limitation within 14 days following the design rainfall event.
 - (2) For retention/detention facilities not able to recover the total required volume within 14 days, the stormwater facility volume shall be increased to retain an additional volume of post minus pre difference in runoff for the 25-year, 24-hour design storm in open basins or for the post minus pre difference in runoff for the 100-year, 24-hour design storm in closed basins. The control elevation for retaining this volume shall be no greater than the top of the constructed stormwater facility. If the infiltration credit is included in the recovery analysis, seepage and infiltration rates will have to be certified by a geotechnical engineer licensed to practice in the State of Florida.
- H) Hydraulic design criteria: The design engineer must submit drainage computations for the hydraulic design of the proposed secondary drainage systems. Specifically, storm sewer systems shall be designed and analyzed to provide sufficient conveyance capacity for the ten-year storm event (Rational method) to prevent upstream surcharging even when the downstream outlet is experiencing tailwater submergence. Roadway spread of water should also be analyzed with inlet spacing based upon both allowable spread width and inlet capacity for the ten-year storm event (Rational method).
- I) Proposed stormwater management system shall be designed to function properly for a minimum 20 year life.

- J) The design and construction of the stormwater management system shall be certified as meeting the requirements of this ARTICLE by a Professional Engineer registered in the State of Florida.
- K) No surface water may be channeled or directed into a sanitary sewer.
- L) Dredging, clearing of vegetation, deepening, widening, straightening, stabilizing or otherwise altering natural surface waters shall be minimized.
- M) Natural surface water shall not be used as sediment traps during or after development.
- N) For aesthetic reasons and to increase shoreline habitat, the shorelines of detention and retention areas shall be sinuous rather than straight.
- O) Water reuse and conservation shall, to the maximum extent practicable, be achieved by incorporating the stormwater management system into irrigation systems serving the development. (If Water Management District allows.)
- P) Vegetated buffers of sufficient width to prevent erosion shall be retained or created along the shores, banks or edges of all natural or man-made surface waters.
- Q) Littoral zones for wet detention ponds shall meet the Saint Johns River Water Management District requirements.
- R) In phased developments the stormwater management system for each integrated stage of completion shall be capable of functioning independently as required by this ARTICLE.
- S) All detention and retention basins shall be adequately accessible for maintenance from streets or public rights-of-way.
- T) Inlets shall be spaced in such a manner as to accept 100% of the design runoff. The maximum allowable gutter run shall be 600 feet. The actual required inlet spacing shall depend on the characteristics of each particular site. Manholes, in accordance with ARTICLE 17, shall be required at the end of each line, and at all changes in grade, size and alignment.
- U) Specifications shall include a section outlining the proposed method of controlling soil erosion during construction. Prior to approval of the Development Plan a Stormwater Pollution Prevention Plan must be submitted to the City Engineer for review and approval in accordance with the City's LDC.
- V) All drainage plans shall be subject to approval by the City Engineer or his Designee. Plan submission shall include clear engineering calculations showing the method of design, including soil information as required by the City Engineer, and existing, as well as proposed, topography.

- W) The required amount of treatment volume for each development shall be based on the Saint Johns River Water Management District regulations.
- X) Discharge from new development shall remain the same as pre-developed flow patterns.
- Y) The City Engineer, at his discretion, may require additional requirements when a project discharges into areas currently under drainage distress.
- Z) All non-conventional retention/detention systems, such as but not limited to exfiltration systems, are not acceptable unless reviewed and approved by City Engineer. Exfiltration type systems must meet the SJRWMD design criteria. Design parameters must be accompanied with signed and sealed Geotechnical Subsurface Investigation with design parameters demonstrating successful recovery of required water quality and quantity volumes.

Section 34.03 DESIGN STORM (minimum)

- A) Retention/Detention basins with positive outfall flows (to Lake Apopka) 25 year, 24 hour (8.5")
- B) Retention/Detention basins (within Closed Basins and/or Land Locked Lakes) 100 year, 24 hours (10.6")
- C) Stormwater Management Systems within FEMA Flood Prone Areas 100 year, 96 hours (14.4")
- D) Collection and conveyance systems (residential streets) 10 year, 1 hour
- E) Collection and conveyance systems (collection and arterial roads) 25 year, 1 hour
- F) Canals 25 year, 24 hour

Section 34.04 DRAINAGE AREA GEOMETRY

- A) Ponds Maximum side slope: 5:1 - Dry pond
5:1 to 2-ft below normal water level, then 2:1 to pond bottom
- Wet pond

- B) Fenced Ponds Not allowed
- C) Maintenance Berms Minimum width: 10'
- D) Easement Widths Minimum width: 20'

All pond and swale side slopes shall be sodded, and bottoms shall be seeded and mulched, except areas designed and approved as littoral zones. Shorelines shall be sinuous rather than straight, so that the length of the shoreline is maximized for growth of littoral vegetation and pollution attenuation.

Section 34.05 MATERIAL AND DESIGN SPECIFICATIONS

- A) Conveyance Pipe
 - 1) Minimum diameter for conveyance pipe shall be 15 inches.
 - 2) Conveyance pipe shall be of reinforced concrete, unless otherwise approved by City Engineer or his Designee.
 - 3) Minimum slope shall be that which produces a minimum flow of 2 ft/sec at low flow.
 - 4) Maximum run between structures or terminating ends shall be 500 feet.
- B) Underdrain Pipe
 - 1) Minimum diameter for underdrain pipe shall be 8 inches.
 - 2) Material
 - a) Polyethylene tubing, satisfying AASHTO M-252 (ADS with drain guard or approved equal.
 - b) PVC, satisfying ASTM D-3033.
 - c) Aluminum, satisfying AASHTO M-196.
 - 3) Filter aggregate: FDOT 902-4.
 - 4) Filter fabric: Mirafi 140 or approved equal.
- C) Design pipe velocity shall normally be less than 10 fps.
- D) Maximum hydraulic grade line shall be one (1) foot below finished edge of pavement elevation for 10 year storm, 0.5 feet below finished edge of pavement elevation for 25 year storm in sump locations.

- E) See ARTICLE 17 of this Manual for Inlet and Structure Specifications.
- F) Fencing of stormwater management areas shall not be allowed.

Section 34.06 FLOOD PRONE AREAS

The floodplain is that area subject to inundation during the 100 year; 24 hour storm event (rainfall depth in accordance with jurisdictional agency). The floodway is that portion of the floodplain that must remain clear of encroachment and shall not exceed the 100 year base flood elevation established on the effective floodplain maps and/or as determined by the City Engineer.

Encroachment may be allowed within the one hundred (100 year floodplain, with compensating storage.

All development within the areas of the 100 year floodplain as delineated on the official Flood Insurance Rate Maps (FIRM) or as determined by the City Engineer, shall comply with the following requirements:

- 1) The lowest floor elevation shall be at least 2 feet above the elevation of the 100 year, 24 hour storm, or at the maximum stage for the 100 year, 4 day storm event (rainfall depth in accordance with jurisdictional agency), whichever is higher.
- 2) For commercial or industrial developments, flood proofing may be substituted in lieu of elevating the lowest floor.
- 3) Compensating storage must be provided for all floodwater displaced by the proposed development below the 100 year 24 hour base flood elevation established by FEMA. Generally, compensating storage must be calculated between the existing 100 year base flood elevation and wet season groundwater/water table elevation. The latter elevation must be determined by a qualified geotechnical engineer, and his report shall identify the historical wet season groundwater/water table; recommend bottom elevations for compensating storage areas; and address the ability of said areas to remain dry and available for floodwater storage.
- 4) Special attention must be given to the project area relationship with the floodplain. An “active” site contributes a pre-development runoff volume in excess of that which is stored on the site during the 100 year storm. A “passive” site contributes a runoff volume less than that which is stored on the site during the 100 year storm. Passive sites must provide special assurances that encroachment is not occurring due to the construction of the development or its ponds. Compensating storage may be claimed in the retention/detention pond system provided it is above the maintained water elevations, and berm elevations are such that the pond system can be inundated during the 100 year storm and still provide the required flood protection, as determined by the City Engineer.

- 5) No development will be permitted in any Area of Special Flood Hazard designation as unnumbered A Zone (no base flood elevation established) until a Conditional Letter of Map Revision is approved by FEMA.
- 6) No development will be permitted in the designated floodway

APPENDIX “C”

CONTRACT FORMS

SECTION 00840

INSTRUCTIONS FOR CONTRACT FORMS

PART 1 – GENERAL

1.01 INSTRUCTIONS FOR NOTICE OF AWARD

- A. The Notice of Award notifies the Contractor that the City Commission has awarded the bid to your company. The Notice of Award contains specific instructions on the requirements for the contract documents and pre-construction meeting.
- B. The contract will accompany the Notice of Award. The Contractor will sign the contract documents and return along with the required insurance certificate, and performance and payment bonds, if required, and any other documents required to finalize the contract documents.

1.02 INSTRUCTIONS FOR NOTICE TO PROCEED

- A. Upon receipt and acceptance of all signed contract documents, including certificate of insurance, and a Certified Copy of the recorded performance and payment bonds, the City will issue a Notice to Proceed.
- B. The Notice to Proceed will contain the start date, substantial completion, and final completion dates for the project.
- C. Contractor is to acknowledge receipt of the Notice to Proceed. The Notice to Proceed will become a part of the contract documents.

1.03 INSTRUCTIONS FOR CHANGE ORDER

- A. In the event a change, modification, deletion and/or increase in material, labor, and/or equipment is needed or requested by the City, the City may seek pricing and/or credit from the Contractor.
- B. If pricing is acceptable by the Engineer, City shall prepare either Form 00842a or Form 00842b “CHANGE ORDER” located in Appendix “C” Contract Forms, and obtain necessary authorization from either the City Manager or City Commission, whichever is applicable, based on approving authority.
- C. Change Order will be executed by Contractor and amended into the contract documents.

1.04 INSTRUCTIONS FOR CERTIFICATE OF SUBSTANTIAL COMPLETION

- A. Upon final inspection and correction of deviations, the City shall prepare Form 00843 “CERTIFICATE OF SUBSTANTIAL COMPLETION”, located in Appendix “C” Contract Forms; where upon execution, the Contractor of the project shall be considered “Substantially Completed.”

1.05 INSTRUCTIONS FOR NON-COMPLIANCE NOTICE

- A. If the Engineer determines the work and/or operations of the Contractor are not in compliance with the Contract document, and/or are being completed in an unsafe or dangerous manner, the Engineer shall provide written notification using Form 00844 “NON-COMPLIANCE NOTICE”, located in Appendix “C” Contract Forms
- B. Contractor shall respond to the “Non-Compliance Notice” within 24 hours with the assertion that the unsafe or dangerous circumstance will be corrected immediately.

1.06 INSTRUCTIONS FOR FIELD ORDER - DIRECTIVE

- A. Contractor may request and/or City may provide field directives as needed, by the City providing the Contractor with a written directive, utilizing Form 00845 “FIELD ORDER/DIRECTIVE”, as located in Appendix “C” Contract Forms.
- B. Written directive shall not be a change that affects the Contract amount, unless an approved Change Order is authorized.

1.07 INSTRUCTIONS FOR REQUEST FOR PROPOSED CHANGE

- A. The City, requesting a change to the Contract, including but not limited to, material, labor, and/or equipment, shall prepare Section A of Form 00847 “REQUEST FOR PROPOSED CHANGE” located in Appendix “C” Contract Forms and provide to Contractor.
- B. Contractor shall submit proposal within seven (7) days of receipt of completed Section A of Form 00847 “REQUEST FOR PROPOSED CHANGE”, including all supporting information needed by the Contractor in developing a complete proposal.
- C. Upon obtaining acceptable proposal from Contractor, the Engineer shall complete Section B of Form 00847 “REQUEST FOR PROPOSED CHANGE” and seek the applicable approval based on City Authorization Authority.

1.08 INSTRUCTIONS FOR TECHNICIAN’S DAILY REPORT

- A. The Engineer or his representative shall on a daily basis review progress of the project, this includes work completed, and shall measure/confirm daily items for payment.
- B. The Engineer or his representative shall record the Contractor’s daily efforts, important issues, weather affecting the Contractor’s efforts, Contractor personnel and equipment needed for daily operations, and measure/confirm daily items for payment in Form 00848 “TECHNICIAN’S DAILY REPORT” (TDR), located in Appendix “C” Contract Forms.

- C. The Engineer or his representative shall maintain an ongoing summary of work to date based on the confirmed TDRs that shall be used for completion of the payment application per Section 00861.

1.09 INSTRUCTIONS FOR APPLICATION AND CERTIFICATION FOR PAYMENTS

- A. To initiate a partial payment, the Contractor shall request completed Form 00861A “APPLICATION FOR PAYMENT” and Form 00861C “SUMMARY OF VALUES TO DATE” located in Appendix “C” Contract Forms from the City. The Contractor’s request shall include the end date for the partial payment period.
- B. City shall provide completed “Application for Payment” and “Summary of Values to Date” forms for Contractor’s use.
- C. Contractor shall cover “Application for Payment” and “Summary of Values to Date” forms with fully executed Form 00861D “CONTRACTOR’S CERTIFICATION OF PAYMENT” located in Appendix “C” Contract Forms for every pay request.

1.10 INSTRUCTIONS FOR CONTRACTOR’S FINAL RELEASE OF LIEN

- A. Contractor shall complete and submit Form 00863 “FINAL RELEASE OF LIEN” located in Appendix “C” Contract Forms including any required supporting information and/or release(s).

1.11 INSTRUCTIONS FOR SHOP DRAWING SUBMITTAL FORM

- A. Contractor shall provide cover on all shop submittals using Form 00864 “SHOP DRAWING SUBMITTAL FORM” located in Appendix “C” Contract Forms for City approval, denial or corrections.
- B. City shall provide copy of cover back with submittals for Contractor use, and if applicable, corrections.

1.12 INSTRUCTIONS FOR CERTIFICATE OF FINAL INSPECTION

- A. City will acknowledge the occurrence of a final inspection by City staff and the Contractor by completing and providing Form 00865 “CERTIFICATE OF FINAL INSPECTION” located in Appendix “C” Contract Forms. Attached to the form shall be a list of outstanding items to be completed.

1.13 INSTRUCTIONS FOR CONTRACTOR REQUEST FOR INFORMATION

- A. During the project, Contractor may want more information or detail from the project designer and/or Engineer. Contractor shall request the information by completing Form 00865 “CONTRACTOR REQUEST FOR INFORMATION” located in Appendix “C” Contract Forms
- B. City shall complete second half of form and provide copy back to Contractor with any supporting information needed to complete the request.

1.14 INSTRUCTIONS FOR WAIVER AND RELEASE OF LIEN UPON FINAL PAYMENT

- A. The Contractor shall obtain and provide originals of the completed Form 00879 “WAIVER AND RELEASE OF LIEN UPON FINAL PAYMENT”, located in Appendix “C” Contract Forms, from each vendor, sub-consultant and/or material supplier that provided notice to the City and/or the Contractor.

1.15 INSTRUCTIONS FOR WAIVER AND RELEASE OF LIEN UPON PROGRESS PAYMENT

- A. The Contractor shall obtain and provide originals of completed Form 00881 “WAIVER AND RELEASE OF LIEN UPON PROGRESS PAYMENT”, located in Appendix “C” Contract Forms, from each vendor, sub-consultant and/or material supplier that provided notice to the City and/or the contractor.

1.16 INSTRUCTIONS FOR CONTRACTOR’S FINAL AFFIDAVIT

- A. Contractor shall execute and submit to the Engineer Form 00883 “CONTRACTOR’S FINAL AFFIDAVIT” located in Appendix “C” Contract Forms.

1.17 INSTRUCTIONS FOR CONTRACTOR’S INTERMIN AFFIDAVIT

- A. Contractor shall execute and submit to the Engineer Form 00885 “CONTRACTOR’S INTERIM AFFIDAVIT” located in Appendix “C” Contract Forms.

END OF SECTION



Mayor
Rusty Johnson

Commissioners
Scott R. Kennedy
District 1

Rosemary Wilsen
District 2

Richard Firstner
District 3

Ages Hart
District 4

City Manager
Robert D. Frank

DATE

Re.: ITB #24-008

NOTICE OF AWARD

Notice is hereby given that your company was awarded the contract to provide construction services related to the Project _____ at the _____, 20__ City Commission meeting.

In accordance with the terms of the Invitation to Bid, you must now execute the contract for the work (two copies enclosed). You must also provide the required performance and payment bond on the forms provided in the Bid Documents, insurance certificate *naming the City as additional insured*, and endorsements. Return all contract documents to my attention within ten (10) business days. The City will date and return a fully executed copy of the contract to you, along with your original copy of the dated bonds. Under the terms of the Invitation to Bid, this Notice of Award shall be rescinded if you do not timely provide the required Contract Documents.

Effective October 1, 2012, revisions to State of Florida Statute 255.05 will apply to this contract. Once you receive the fully executed contract and dated bonds from the City, you will need to record the performance and payment bonds with Orange County. You are required to provide the City with a certified copy of the recorded bonds before the City can issue the Notice to Proceed or make any payment for the project.

Additionally, please contact _____, at (407) 905-31__ to schedule the pre-construction meeting for this project. The certified copy of the recorded bonds to be provided to the City prior to or at the pre-construction meeting. Completion dates will be established at the pre-construction meeting. Work shall begin pursuant to the effective date established by the Notice to Proceed.

The City of Ocoee looks forward to working with your company on this project.

Sincerely,

Shannon Hopper
Purchasing Technician

cc. _____, Utilities Director

NOTICE TO PROCEED



**1 N. Bluford Avenue
Ocoee, Florida 34761**

DATE: _____

Name, Title
Company's Name
Address
Address

RE: Notice to Proceed on Project

Project: _____

You are notified that the Contract Time under the above contract will commence to run on _____, 20__. On that date you are to start performing the Work and your other obligations under the Contract Documents. Based on the Contract Time stated in the Agreement, we calculate that the dates of Substantial Completion and Final Completion are _____, 20__ and _____ 20__, respectively.

<u>Acknowledge Receipt of Notice</u>	
OWNER: CITY OF OCOEE	CONTRACTOR:
_____ (Authorized Signature)	By: _____ (Signature)
_____, Utilities Director	_____ (print or type name)
	_____ (Title)
	_____ (Date)



CITY OF OCOEE
1 N. Bluford Avenue
Ocoee, Florida 34761

This Change Order requires action by the City Commission

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

CHANGE ORDER NO. ____

DATE: _____

PURCHASE ORDER: _____

The following changes are hereby made to the CONTRACT DOCUMENTS.

Original CONTRACT PRICE	<u>\$0.00</u>
-------------------------	---------------

Current CONTRACT PRICE ADJUSTED by previous CHANGE ORDERS	<u>\$0.00</u>
---	---------------

Net Increase (Decrease) Resulting from this CHANGE ORDER	<u>\$0.00</u>
--	---------------

The current CONTRACT PRICE including this CHANGE ORDER	<u>\$0.00</u>
--	---------------

Original CONTRACT COMPLETION DATE:	<u>[original contract date]</u>
------------------------------------	---------------------------------

Current CONTRACT COMPLETION DATE adjusted by previous CHANGE ORDERS	<u>[current contract date]</u>
--	--------------------------------

Net Increase Resulting from this CHANGE ORDER	<u>[number] days</u>
---	----------------------

Current CONTRACT COMPLETION DATE including this CHANGE ORDER	<u>[new contract date]</u>
---	----------------------------

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

CHANGES ORDERED:

I. REQUIRED CHANGES

II. JUSTIFICATION

III. NARRATIVE OF NEGOTIATIONS

IV. PAYMENT

V. APPROVAL AND CHANGE AUTHORIZATION

The original project and funding allocation were established by issuance of a CITY purchase order, subject to the terms and conditions contained in the CITY's solicitation, Project Manual, Drawings, Specifications, and/or the CONTRACTOR's service and price proposal, which collectively form the terms of an agreement between the CITY and the CONTRACTOR for the performance of the Work. This proposed change to the agreement requires approval by the City Commission under the CITY's Purchasing Rules and Regulations and is consistent with any prior action by the City Commission to award the Work to the CONTRACTOR. It is expressly understood and agreed that the approval of the Change Order shall have no effect on the original agreement other than matters expressly provided herein.

CONTRACTOR acknowledges, by its execution and acceptance of this Change Order, that the adjustments in contract price and time shown hereon constitute full and complete compensation and satisfaction for all costs and modifications of performance time incurred by the CONTRACTOR as a result of this Change Order. No other claim for increased costs of performance or modifications of time will be granted by the CITY for the Work covered by this Change Order. The CONTRACTOR hereby waives and releases any further claims for cost or time against the CITY arising from or relating to the matters or Work set forth or contemplated by this Change Order.

[Balance of this page was left blank intentionally]

RECOMMENDED BY:

CITY OF OCOEE, FLORIDA

By: _____
Signature

Date: _____

Title: _____

APPROVED BY:

CITY OF OCOEE, FLORIDA

By: _____
Rusty Johnson, Mayor

FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, APPROVED AS TO FORM
AND LEGALITY THIS _____ DAY OF
_____, 20____

By: _____
City Attorney

ACCEPTED BY:

CONTRACTOR

By: _____
Signature

Date: _____

Title: _____

Date: _____

Attest: _____
Melanie Sibbitt, Acting City Clerk

APPROVED BY THE CITY OF OCOEE
COMMISSION IN A MEETING HELD ON
_____, 20____ UNDER
AGENDA ITEM NO. _____.



CITY OF OCOEE
1 N. Bluford Avenue
Ocoee, Florida 34761

This Change Order can be authorized by the City Manager

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

CHANGE ORDER NO. ____

DATE: _____ PURCHASE ORDER: _____

The following changes are hereby made to the CONTRACT DOCUMENTS.

Original CONTRACT PRICE **\$0.00**

Current CONTRACT PRICE ADJUSTED by previous CHANGE ORDERS **\$0.00**

Net Increase (Decrease) Resulting from this CHANGE ORDER **\$0.00**

The current CONTRACT PRICE including this CHANGE ORDER **\$0.00**

Original CONTRACT COMPLETION DATE: **[original contract date]**

Current CONTRACT COMPLETION DATE adjusted by previous
CHANGE ORDERS **[current contract date]**

Net Increase Resulting from this CHANGE ORDER **[number] days**

Current CONTRACT COMPLETION DATE including this
CHANGE ORDER **[new contract date]**

Ocoee WWTF Electrical Upgrade and Expansion - Rebid
ITB #24-008

CHANGES ORDERED:

I. REQUIRED CHANGES

II. JUSTIFICATION

III. NARRATIVE OF NEGOTIATIONS

IV. PAYMENT

V. APPROVAL AND CHANGE AUTHORIZATION

The original project and funding allocation was established by issuance of a CITY purchase order, subject to the terms and conditions contained in the CITY's solicitation, Project Manual, Drawings, Specifications, and/or the CONTRACTOR's service and price proposal, which collectively form the terms of an agreement between the CITY and the CONTRACTOR for the performance of the Work. This proposed change to the agreement requires approval by the City Manager under the CITY's Purchasing Rules and Regulations and is consistent with any action by the City Commission to award the Work to the CONTRACTOR. It is expressly understood and agreed that the approval of the Change Order shall have no effect on the original agreement other than matters expressly provided herein.

CONTRACTOR acknowledges, by its execution and acceptance of this Change Order, that the adjustments in contract price and time shown hereon constitute full and complete compensation and satisfaction for all costs and modifications of performance time incurred by the CONTRACTOR as a result of this Change Order. No other claim for increased costs of performance or modifications of time will be granted by the CITY for the Work covered by this Change Order. The CONTRACTOR hereby waives and releases any further claims for cost or time against the CITY arising from or relating to the matters or Work set forth or contemplated by this Change Order.

[Balance of this page was left blank intentionally]

RECOMMENDED BY:

CITY OF OCOEE, FLORIDA

By: _____

Signature

Date: _____

Title: _____

APPROVED BY:

CITY OF OCOEE, FLORIDA

By: _____

Charles K. Smith, Department Director

By: _____

Wanda Horton, Director of Finance

By: _____

Robert D. Frank, City Manager

By: _____

Rusty Johnson, Mayor

FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, APPROVED AS TO FORM
AND LEGALITY THIS _____ DAY OF
_____, 20____

By: _____

City Attorney

ACCEPTED BY:

[contractor name]

By: _____

Signature

Date: _____

Title: _____

Date: _____

Date: _____

Date: _____

Date: _____

Attest: _____

Melanie Sibbitt, Acting City Clerk

APPROVED BY THE CITY OF OCOEE
COMMISSION IN A MEETING HELD ON
_____, 20____ UNDER
AGENDA ITEM NO. _____.

SECTION 00843
CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNER's Project No. _____
ENGINEER's Project No. _____

CONTRACTOR _____
Contract For _____
Contract Date _____

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

To _____
Owner

And To _____
Contractor

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on _____,
(Date of Substantial Completion).

A tentative list of items to be completed or corrected is attached hereto; Contractor shall provide the cost to complete each item. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. When this Certificate applies to a specified part of the Work the items in the tentative list shall be completed or corrected by CONTRACTOR within ____ days of the above date of Substantial Completion.

The date of Substantial Completion is the date upon which all guarantees and warranties begin, except as follows:

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities and insurance shall be as follows:

RESPONSIBILITIES:

OWNER

CONTRACTOR

The following documents are attached to and made a part of this Certificate:

Executed by ENGINEER on _____, 20

(Engineer)

By _____

The CONTRACTOR accepts this Certificate of Substantial Completion on:

_____, 20____.

(Contractor)

By _____

END OF SECTION



CITY OF OCOEE

1 N. Bluford Avenue
Ocoee, Florida 34761

NON-COMPLIANCE NOTICE

NO.: _____

PROJECT DATA:

NAME: Ocoee WWTF Electrical Upgrade and Expansion - Rebid
Bid ITB #24-008

LOCATION: _____

OTHER: _____

PROJECT NO.: _____

DATE: _____

REFERENCE.: _____

TO (CONTRACTOR):

Non-compliance Notice was
received by Contractor on (date): _____

By: _____

Title: _____

You are hereby notified that the following work or materials
does not conform to the requirements of the Contract
Documents noted above.

Non-complying work may be required to be removed and
replaced at no cost to the Owner.

It shall be your responsibility to determine the corrective
action necessary, and to determine whether you wish to
discontinue operations until additional investigation by the
Owner or Engineer confirm or refute the initial findings.

If you should not correct non-complying work in a timely manner, or continue to
perform non-comply work, the Owner may stop the Work. (GC-13.10, SC-13.11).

DESCRIPTION (of non-conforming work or materials): _____

ISSUED BY: _____

TITLE: _____

ATTACHMENTS (Listing of attached documents that support description):

1. Contractor Request for Information No. _____

2. _____

3. _____

4. _____

5. _____

6. _____

☐ OWNER: _____

☐ ENGINEER: _____

☐ SUBCONSULTANT: _____

☐ CONTRACTOR: _____

☐ FIELD: _____

☐ OTHER: _____



CITY OF OCOEE

1 N. Bluford Avenue
Ocoee, Florida 34761

FIELD ORDER & DIRECTIVE

NO.: _____

PROJECT DATA:

NAME: Ocoee WWTF Electrical Upgrade and Expansion - Rebid

Bid: ITB 24-008

LOCATION: _____

OTHER: _____

PROJECT NO.: _____

DATE: _____

REFERENCE: _____

TO (CONTRACTOR):

Field Order was received on (date): _____

By: _____

Title: _____

You are hereby directed to execute promptly this Field Order which interprets the Contract Documents or orders minor changes in the Work without change in Contract Sum or Contract Time.

If you consider that a change in Contract Sum or Contract Time is required, please submit your itemized proposal to the Engineer immediately and before proceeding with this Work. If your proposal is found to be satisfactory and in proper order, this Field Order will in that event be superseded by a Change Order.

DESCRIPTION (of interpretation or change): _____

ISSUED BY: _____

TITLE: _____

ATTACHMENTS (Listing of attached documents that support description):

1. Contractor Request for Information No. _____

4. _____

2. _____

5. _____

3. _____

6. _____

☐ OWNER: _____

☐ CONTRACTOR: _____

☐ ENGINEER: _____

☐ FIELD: _____

☐ SUBCONSULTANT: _____

☐ OTHER: _____



CITY OF OCOEE
1 N. Bluford Avenue
Ocoee, Florida 34761

**REQUEST FOR PROPOSED
CHANGE**

NO. _____

SECTION A: City shall complete to request proposal from Contractor

PROJECT DATA:

NAME: Ocoee WWTF Electrical Upgrade and Expansion - Rebid

PROJECT NO: _____

LOCATION: _____

OTHER: _____

DATE: _____

REFERENCE: _____

TO (CONTRACTOR): _____
Please provide the undersigned a proposal for the following change in the work within seven (7) calendar days after receipt of this request. The written proposal must clearly delineate the scope of the proposed change in the work providing an itemized estimate of the time and all material and labor (by trade), subcontract and overhead costs and fees. Any amount claimed for subcontracts must be similarly supported.

DESCRIPTION of change in work: _____

Change Order Type: ☐ Deletion ☐ Addition ☐ Revision ☐ Other: ()

Constraints of Change: _____

Initiated by: ☐ Changes in Owner Requirements ☐ Unforeseen Conditions ☐ Others: ()

Proposal must be received by: _____

ATTACHMENTS (Listing of attached documents that support description):

1. Contractor Request for Information No. _____

4. _____

2. Plan Revisions: _____

5. _____

3. _____

6. _____

☐ OWNER: _____

☐ CONTRACTOR: _____

☐ ENGINEER: _____

☐ FIELD: _____

☐ CONSTRUCTION ADMINISTRATOR: _____

☐ OTHER: _____

☐ SUBCONSULTANT: _____

Date Received From Contractor: _____

Date Returned to Contractor With Comments: _____

Date Returned to City: _____

Section B: To be completed by City after receipt of Proposal from Contractor

PRICING INFORMATION:

Method of Pricing:

- A. ☐ Established Contract Unit Price(s)
B. ☐ Negotiated Unit Price(s) (including Overhead and Profit)
C. ☐ Negotiated Lump Sum (including Overhead and Profit)
D. ☐ Actual Cost of Work plus Fixed Percent for Overhead and Profit
E. ☐ A combination of A, B, C, D

DESCRIPTION OF WORK:

- ☐ By General Contractor ☐ By Subcontractor

ITEM OF WORK	QUANTITY	PRICE	TOTAL

Attach additional pages if necessary.

NET TOTAL COST OF THIS CHANGE PROPOSAL \$ _____

EXTENSION OF CONTRACT TIME:

As part of this Change Proposal the Contractor requests an extension of the contract time in the amount of _____ additional days.

Provide thorough documentation in support of the request for additional time: _____

A requirement of this Change Proposal will be to provide record drawing information for all of the affected items of work

RECOMMENDATION BY ENGINEER/CONSTRUCTION ADMINISTRATOR:

Comments: _____

Signature of Engineer/Construction Administrator: _____ Date: _____

ACCEPTANCE BY OWNER:

Comments: _____

Signature: _____ Date: _____

I, _____, of _____ agree to the costs and terms of RFP _____
(Name) (Company) (No.)
this _____ day of _____, 2018
(day) (month) (year)

Technician's Daily Report

Date: _____

Project Name: _____

Pay Items

[illegible]

Conditions & Resources

Element	Adequate	Inadequate	Notes
Weather	☐	☐	
Equipment	☐	☐	
Manpower	☐	☐	

Description of Work

More ☐

Contractor

Inspector _____

SECTION 00861A
APPLICATION FOR PAYMENT

Application No.____ Progress Payment_____ Final Payment_____ P.O. No.: _____

Contractor: _____ Contract Date: _____

Application Date: _____ For Period Ending _____

City Project Nos.: _____

Project Name: ITB 24-008 Ocoee WWTF Electrical Upgrade and Expansion - Rebid

Construction Start Date: _____ End Date: _____

Construction Days – Total: _____ Elapsed: _____ Remaining: _____

1. Original Contract Amount \$ _____
2. Sum of Approved Change Orders to Date (from Table) \$ _____
3. Current Contract Amount (Sum of Lines 1 and 2) \$ _____
4. Total of Prior Pay Applications (including retainage) \$ _____
5. Amount of this Pay Application (including retainage;
from Bid Item Quantity Spreadsheet) \$ _____
6. Total Earned to Date (Sum of Lines 4 and 5) \$ _____
7. Total of Payments Made by City to Date \$ _____
8. Retainage Held from Prior Pay Applications \$ _____
9. Retainage to Be Held in this Pay Application \$ _____
10. Total Retainage Held to Date (Sum of Lines 8 and 9) \$ _____
11. Total Earned to Date less Retainage (Line 6 minus Line 10) \$ _____
12. Total Earned less Retainage for this Pay Application
(Line 5 minus Line 9) \$ _____
13. Total Amount to Be Paid by City for this Application
(Line 11 minus Line 7) \$ _____

Approved Change Orders

Change Order No.	Date Approved by City	Date Accepted by Contractor	Total Change in Contract Price
Total (Write in Line 2, above)			

Project Earnings, Retainage and Payment Summary

Project:

Contractor: 0

[illegible]

Contractor's Certification of Payment

The undersigned Contractor hereby swears under penalty of perjury that (1) all previous progress payments received from the Owner on account of Work performed under the contract referred to above have been applied by the undersigned to discharge in full all obligations of the undersigned incurred in connection with Work covered by prior Applications for Payment numbered 1 through ____ inclusive (not applicable for first application.); and (2) all materials and equipment incorporated in said Project or otherwise listed in or covered by this Application for Payment are free and clear of all liens, claims, security interest and encumbrances; (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective as that term is defined in the Contract Documents.

Dated _____, 20__

(Contractor)

By: _____

(Name)

(Title)

COUNTY OF _____

STATE OF _____

Before me on this _____ day of _____, 20__, personally appeared _____, known to me, who being duly sworn, deposes and says that (s)he is the _____ of the Contractor above mentioned; that(s) he executed the above Application for Payment and statement on behalf of said Contractor; and that all of the statements contained therein are true, correct and complete.

Notary Public

My Commission Expires _____

Payment shown on Line 13 is recommended by City's Resident Project Representative and authorized by the Owner:

By: _____
Representative's Authorized Signature

Date: _____

By: _____
Owner's Authorized Signature

Date: _____

Title

CONTRACTOR'S FINAL RELEASE OF LIEN

Before me the undersigned authority in said County and State, appeared _____ who, being first duly sworn, deposes and says that he is _____ of _____, a company and/or corporation authorized to do business under the laws of Florida, which is the Contractor on the Contract described as: _____ dated the _____ day of _____, 20____, that the said deponent is duly authorized to make this affidavit by resolution of the Board of Directors of said company and/or corporation; that deponent knows of his own knowledge that said Contract has been complied with in every particular by said Contractor and that all parts of the work have been approved by the Owner's Engineers; that there are no bills remaining unpaid for labor, material, or otherwise, in connection with said Contract and work, and that there are no suits pending against the undersigned as Contractor or anyone in connection with the work done and materials furnished or otherwise under said Contract. Deponent further says that the final estimate which has been submitted to the owner simultaneously with the making of the affidavit constitutes all claims and demands against the Owner on account of said Contract or otherwise, and the acceptance of the sum specified in said final estimate will operate as a full and final release and discharge of the Owner from any further claims, demands or compensation by Contractor under the above Contract. Deponent further agrees that all guarantees under this Contract shall be in full force from the date of this release as spelled out in the Contract Documents.

Sworn to and subscribed to before me this _____ day of _____, 20____.

Notary Public

My Commission Expires _____

We, the _____ having heretofore executed a Performance Bond for the above-mentioned Contractor covered Project and Section as described above in the sum of _____ dollars (\$ _____), hereby agree that the Owner may make full payment of the final estimate, including the retained percentage, to said Contractor.

It is fully understood that the granting of the right to the Owner to make payment of the final estimate to said Contractor and/or his assigns, shall in no way relieve the surety company of its obligations under its bond, as set forth in the Specifications, Contract and Bond pertaining to the above Project.

IN WITNESS WHEREOF, the _____ has caused
this instrument to be executed on its behalf by its _____
and/or its duly authorized attorney in fact, and its corporate seal to be hereunto affixed, all of this
_____ day of _____, A.D., 20_____.

Surety Company

Attorney in Fact

(Power of Attorney must be attached if executed by Attorney in Fact)

STATE OF FLORIDA

COUNTY OF _____

Before me the undersigned authority, personally appeared to me well known as the person
described in and who executed the foregoing instrument in the name of
_____ and/or _____ purpose therein
expressed and that he had due and legal authority to execute the same on behalf of said
_____, a corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal at
_____ this _____ day of _____,
20_____.

Notary Public

END OF SECTION

SHOP DRAWING SUBMITTAL

Owner: City of Ocoee
1800 A. D. Mims
Ocoee, Fl. 34761

Specification No.: _____
Project: _____

Contractor: _____

FOR CITY USE ONLY

DATE RECEIVED _____

DATE RETURNED _____

Owner's
Project No.: _____

Contractor's
Submittal No.: _____

Contractor's
Project No.: _____

Resubmittal Yes _____ No _____

ITEM NO	RESUBMITTAL NO.	NO. COPIES	VENDOR	DESCRIPTION	ENGINEER'S ACTION

ACTION CODE (As defined in the General Conditions)

A	APPROVED	SUBMITTED BY: _____ Contractor
AN	APPROVED AS NOTED	
AN/R	APPROVED AS NOTED	
NA/R	NOTED, RESUBMIT SPECIFIED ITEMS	
NA/R	NOT APPROVED/REVISE AND RESUBMIT	DATE: _____
(DO NOT ORDER OR FABRICATE UNTIL APPROVED)		

ENGINEERS COMMENTS:

Distribution

- Contractor _____ Copies
- Owner _____ Copies
- ML Office _____ Copies
- ML Subconsultant _____ Copies
- ML Field _____ Copies

Discipline Review:

Reviewed By _____ Date _____

Discipline Review:

Reviewed By _____ Date _____

Project Manager _____ Date _____

END OF SECTION

CERTIFICATE OF FINAL INSPECTION

Agreement Title: _____

City Contract No.: _____

TO: CONTRACTOR: _____

Project Manager: _____

A joint inspection of the Work described in the Contract Documents has been made by the Owner, the Owner's Engineer and the Contractor on _____ (date) in accordance with Section 1.14.A of the General Requirements, and is accepted by the Owner, subject to the provisions of subsection 1.14.B.4 of the General Requirements for a Corrective Period subject to the provisions of Article 13.07 of the General Conditions or as otherwise agreed upon and attached.

Accepted by:

CONTRACTOR

By: _____

Date: _____

ENGINEER

By: _____

Date: _____

Approved:

OWNER: _____

Date: _____

Date: _____



CITY OF OCOEE
1 N. Bluford Avenue
Ocoee, Florida 34761

**CONTRACTOR'S REQUEST
FOR
INFORMATION**

No.: _____

PROJECT DATA:

NAME: Ocoee WWTF Electrical Upgrade and Expansion - Rebid

Bid: ITB # 24-008

LOCATION: _____

OTHER: _____

PROJECT NO.: _____

DATE: _____

REFERENCE: _____

QUESTION:

BY: _____

DATE: _____

REPLY:

BY: _____

DATE: _____

☐ OWNER: _____

☐ CONTRACTOR: _____

☐ ENGINEER: _____

☐ FIELD: _____

☐ SUBCONSULTANT: _____

☐ OTHER: _____

This Instrument Prepared By:

Name _____

Address _____

**WAIVER AND RELEASE OF LIEN
UPON FINAL PAYMENT**

The undersigned lienor, in consideration of the final payment in the amount of \$ _____, hereby waives and releases its lien and right to claim a lien for labor, services or materials furnished through _____, 20 ____, to _____ (customer) on the job of _____ (owner of property) to the following described property:

WITNESS my hand and seal this _____ day of _____, 20 ____.

Lienor's Name _____

Address _____

By _____

Printed Name _____

Sworn to and subscribed before me by _____ who is personally known to me or produced _____ as identification, and who did ____ take an oath, this _____ day of _____, 20 ____.

Signature of Notary _____

SEAL:

Printed Name of Notary _____

Commission No./Expiration _____

This Instrument Prepared By:

Name _____

Address _____

**WAIVER AND RELEASE OF LIEN
UPON PROGRESS PAYMENT**

The undersigned lienor, in consideration of the sum of \$ _____, hereby waives and releases its lien and right to claim a lien for labor, services or materials furnished through _____, 20 ____, to _____ (customer) on the job of _____ (owner of property) to the following described property:

This waiver and release does not cover any retention or labor, services, or materials furnished after the date specified.

WITNESS my hand and seal this _____ day of _____, 20 ____.

Lienor's Name _____

Address _____

By _____

Printed Name _____

Sworn to and subscribed before me by _____ who is personally known to me or produced _____ as identification, and who did ____ take an oath, this _____ day of _____, 20 ____.

Signature of Notary _____

SEAL:

Printed Name of Notary _____

Commission No./Expiration _____

CONTRACTOR'S FINAL AFFIDAVIT

STATE OF FLORIDA,
COUNTY OF _____.

BEFORE ME, the undersigned authority, duly authorized to administer oaths and take acknowledgments, personally appeared _____ who being duly sworn, deposes and says:

1. He is the _____ (title) of _____ (name of business) hereinafter referred to as "Contractor."
2. At all times material hereto, Contractor has been doing business in _____ County, Florida.
3. This Affidavit is made pursuant to Section 713.06(3)(d)(1), Florida Statutes, for the purpose of acknowledging full and final payment to the Contractor for work done and materials supplied on real property described as: (property description)
4. That all lienors engaged by the Contractor to perform or provide labor, services and/or materials under the contract between Contractor and the owner of the above-described property have been paid in full, except as follows:

Name/Address _____
Amount Due _____

Name/Address _____
Amount Due _____

FURTHER AFFIANT SAYETH NOT.

(Signature of Contractor)

Sworn to and subscribed before me by _____ who is personally known to me or produced _____ as identification, and who did _____ take an oath, this _____ day of _____, 20 ____.

Signature of Notary _____
Printed Name of Notary _____
Commission No./Expiration _____
SEAL:

CONTRACTOR'S INTERIM AFFIDAVIT

STATE OF FLORIDA,
COUNTY OF _____.

BEFORE ME, the undersigned authority, duly authorized to administer oaths and take acknowledgments, personally appeared _____ who being duly sworn, deposes and says:

1. He is the _____ (title) of _____ (name of business) hereinafter referred to as "Contractor."

2. At all times material hereto, Contractor has been doing business in _____ County, Florida.

3. This Affidavit is made pursuant to Section 713.06(3)(c)(1), Florida Statutes, for the purpose of acknowledging full payment to the Contractor for work done and materials supplied through _____, 20 ____, on real property described as: (property description)

4. That all lienors engaged by the Contractor to perform or provide labor, services and/or materials under the contract between Contractor and the owner of the above-described property have been paid in full for all work done or materials supplied through _____, 20 ____, except as follows:

Name/Address _____
Amount Due _____

Name/Address _____
Amount Due _____

FURTHER AFFIANT SAYETH NOT.

(Signature of Contractor)

Sworn to and subscribed before me by _____ who is personally known to me or produced _____ as identification, and who did ____ take an oath, this _____ day of _____, 20 ____.

Signature of Notary _____
Printed Name of Notary _____
Commission No./Expiration _____

SEAL:

Ocoee WWTF

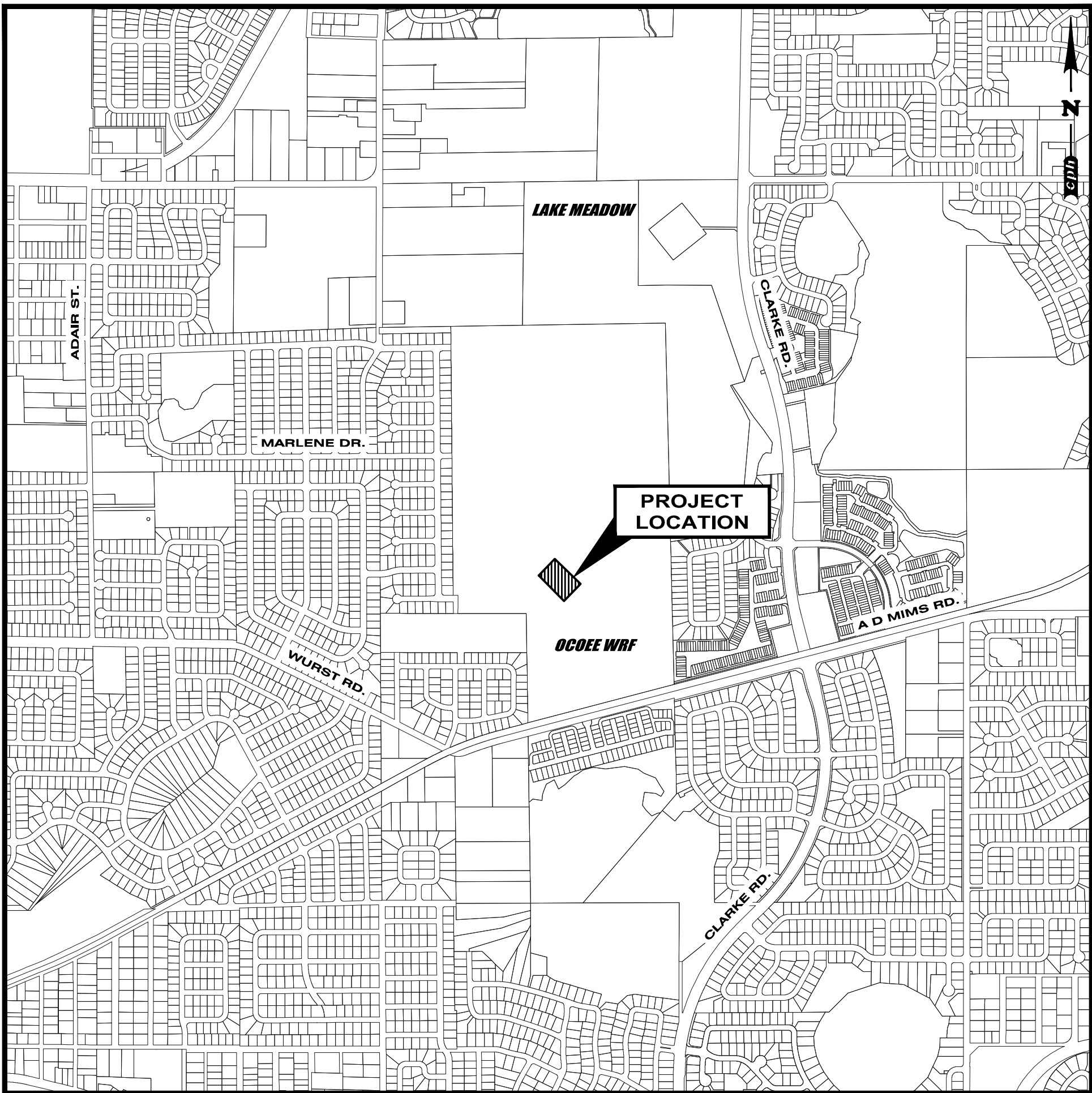
Electrical Upgrade And Expansion

October 2023



CITY OFFICIALS:

MAYOR:	RUSTY JOHNSON
COMMISSIONER DISTRICT 1:	SCOTT R. KENNEDY
COMMISSIONER DISTRICT 2:	ROSEMARY WILSEN
COMMISSIONER DISTRICT 3:	RICHARD FIRSTNER
COMMISSIONER DISTRICT 4:	AGES HART
CITY MANAGER:	ROBERT D. FRANK
ASSISTANT CITY MANAGER:	CRAIG SHADRIX
UTILITIES DIRECTOR:	JAMIE CROTEAU
ASSISTANT UTILITIES DIRECTOR:	JENNIFER BOLLING, P.E.



VICINITY MAP
N.T.S.

ADDRESS: 1810 A.D. MIMS ROAD, OCOEE, FL. 34761
PERMIT NUMBER: FLA010815

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Orlando, FL 32801
Ph: 407.425.0452

Plans Prepared By:
CPH, LLC
A Full Service A & E Firm

State of Florida Licenses:
Engineer No. 3215
Surveyor No. LB7143
Architect No. AA26000926
Landscape No. LC000298

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ROBERTO MARCOS GONZALEZ, P.E.
P.E. LIC. # 56875

Sheet No.
C-1



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BID SET

1. THE CONTRACTOR SHALL OBTAIN FROM THE OWNER COPIES OF ALL AVAILABLE REGULATORY AGENCY PERMITS AND LOCAL AGENCY PERMITS.
2. ALL CONSTRUCTION PROJECTS 1' OR MORE ACRES IN SIZE THAT DISCHARGE TO OFFSITE AREAS ARE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORMWATER DISCHARGE FROM SMALL AND LARGE CONSTRUCTION ACTIVITIES. IN ORDER TO MEET NPDES REQUIREMENTS, THE CONTRACTOR IS RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP), IMPLEMENTING, INSPECTING, MAINTAINING, AND REPORTING ON ALL ELEMENTS OF THE SWPPP, COMPLETING AND SUBMITTING THE REQUIRED NOTICE OF INTENT (NOI) AND NOTICE OF TERMINATION (NOT) FORMS AS THE OPERATOR, AND PAYING ALL ASSOCIATED FEES. FOR PROJECTS LESS THAN 1 ACRE IN SIZE THAT ARE NOT REQUIRED TO COMPLY WITH THE NPDES GENERAL PERMIT, THE CONTRACTOR IS STILL RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO AND DURING CONSTRUCTION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
3. UNLESS OTHERWISE NOTED ON THE PLANS, THE CONTRACTOR SHALL USE THE GEOMETRY PROVIDED ON THE CONSTRUCTION PLANS. BENCHMARK INFORMATION SHALL BE PROVIDED TO THE CONTRACTOR BY THE OWNER OR OWNERS SURVEYOR. ANY DISCREPANCIES BETWEEN FIELD MEASUREMENTS AND CONSTRUCTION PLAN INFORMATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. CONTRACTOR SHALL PROVIDE A PRECONSTRUCTION VIDEO DOCUMENTING THE EXISTING CONDITIONS FROM RIGHT-OF-WAY TO RIGHT-OF-WAY ALONG PROJECT LIMITS.
5. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE MATERIALS REQUIRED FOR CONSTRUCTION. PRIOR TO SUBMISSION, THE CONTRACTOR SHALL THOROUGHLY CHECK SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES FOR COMPLETENESS AND FOR COMPLIANCE WITH THE CONSTRUCTION PLANS AND SHALL VERIFY ALL DIMENSIONS AND FIELD CONDITIONS SHALL COORDINATE THE SHOP DRAWINGS WITH THE REQUIREMENTS FOR OTHER RELATED WORK. THE CONTRACTOR'S RESPONSIBILITY FOR ERRORS AND OMISSIONS IN SUBMITTALS IS NOT RELIEVED BY THE ENGINEER'S REVIEW OF SUBMITTALS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER, IN WRITING AT THE TIME OF SUBMISSION, OF DEVIATIONS IN SUBMITTALS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
6. PROTECT BENCHMARKS, PROPERTY CORNERS, AND OTHER SURVEY MONUMENTS FROM DAMAGE OR DISPLACEMENT. IF MARKER NEEDS TO BE REMOVED IT SHALL BE REFERENCED BY LICENSED LAND SURVEYOR AND REPLACED, AS NECESSARY, BY SAME.
7. THE CONTRACTOR SHALL COORDINATE QUALITY CONTROL TESTING. AS A MINIMUM, TESTING SHALL INCLUDE A) PIPING AND STRUCTURAL EXCAVATION, BEDDING AND BACKFILL, MATERIALS AND DENSITY TESTS; B) DETERMINATION OF COMPACTIVE EFFORT NEEDED FOR COMPLIANCE WITH THE DENSITY REQUIREMENTS; C) PORTLAND CEMENT CONCRETE AND ASPHALT PAVING QUALITY CONTROL TESTING INCLUDING DESIGN MIX REVIEW, MATERIALS, FIELD SLUMP AND AIR CONTENT, AND FIELD AND LAB CURED STRENGTH SAMPLES AND TESTING.
8. IN ADDITION TO QUALITY CONTROL TESTING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REQUIRED TESTING OR APPROVALS FOR ANY WORK (OR ANY PART THEREOF) IF LAWS OR REGULATIONS OF ANY PUBLIC BODY HAVING JURISDICTION SPECIFICALLY REQUIRE TESTING, INSPECTIONS OR APPROVAL. THE CONTRACTOR SHALL PAY ALL COSTS IN CONNECTION THEREWITH AND SHALL FURNISH THE OWNER AND ENGINEER THE REQUIRED CERTIFICATES OF INSPECTION, TESTING OR APPROVAL.
9. TESTING RESULTS SHALL BE PROVIDED TO THE OWNER/OPERATOR AND THE ENGINEER. ALL TEST RESULTS SHALL BE PROVIDED (PASSING AND FAILING) ON A REGULAR AND IMMEDIATE BASIS.
10. THE ENTIRE PROJECT SITE SHALL BE THOROUGHLY CLEANED AT THE COMPLETION OF THE WORK. CLEAN ALL INSTALLED PIPELINES, STRUCTURES, SIDEWALKS, PAVED AREAS, ACCUMULATED SILT IN PONDS, PLUS ALL ADJACENT AREAS AFFECTED BY CONSTRUCTION, AS DIRECTED BY THE OWNER OR JURISDICTIONAL AGENCY. EQUIPMENT TO CLEAN THESE SURFACES SHALL BE SUBJECT TO APPROVAL BY THE OWNER.
11. CHAPTER 566, FLORIDA STATUTES, REQUIRES EXCAVATORS TO NOTIFY SUNSHINE STATE ONE CALL OF FLORIDA (SSOCOF) BEFORE BEGINNING ANY EXCAVATION IN THE STATE OF FLORIDA UNLESS A SPECIFIC EXEMPTION LISTED IN F.S. 566.10 APPLIES. AN EXCAVATOR MUST NOTIFY SSOCOF TWO FULL BUSINESS DAYS BEFORE EXCAVATING. EXCAVATORS MAY CALL 1-800-432-4770 DURING BUSINESS HOURS OR USE THE INTERNET TO PROVIDE NOTIFICATION INFORMATION.

1. THE UTILITY DATA SHOWN ON THESE PLANS WAS LOCATED BY THE RESPECTIVE UTILITY, OR IS BASED ON UTILITY DRAWINGS, MAPS, OR FIELD RECONNAISSANCE.
2. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATIONS OF THESE UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING AN UNDERGROUND UTILITY, WHETHER SHOWN ON THE PLANS OR LOCATED BY THE UTILITY COMPANY. ANY UTILITIES, WHETHER SHOWN ON THESE PLANS OR NOT, THAT INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER AND THE RESPECTIVE UTILITY COMPANY FOR RELOCATION OR PROPER INTERSECTION.
3. A SINGLE POINT UTILITY IDENTIFICATION SERVICE HAS BEEN SET UP FOR EXISTING UTILITIES. THE CONTRACTOR IS TO CONTACT THE SUNSHINE STATE ONE CALL CENTER BY DIALING "811" AT LEAST TWO (2) AND NO MORE THAN FIVE (5) WORKING DAYS PRIOR TO THE SPECIFIC CONSTRUCTION ACTIVITY FOR FIELD LOCATION. NOTE THAT NOT ALL UTILITIES PARTICIPATE IN THIS PROGRAM. THE CONTRACTOR SHOULD CONTACT ALL NON-PARTICIPATING UTILITIES SEPARATELY FOR FIELD LOCATION OF THEIR FACILITIES AT LEAST TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION. PER FLORIDA STATUTE 553.851, THE CONTRACTOR OR EXCAVATOR IS REQUIRED TO NOTIFY THE GAS COMPANY TWO (2) WORKING DAYS PRIOR TO STARTING EXCAVATION.
4. THE FOLLOWING UTILITIES MAY HAVE FACILITIES IN THE VICINITY OF THE CONSTRUCTION AREA:

CITY OF OCOCEE
DUKE ENERGY
5. THE CONTRACTOR SHALL KEEP LOCATE TICKETS UP TO DATE AT ALL TIMES.
6. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION WITH EACH UTILITY AND ALL COSTS ASSOCIATED WITH THE PROTECTION OF EXISTING FACILITIES DURING CONSTRUCTION. THE CONTRACTOR SHALL ALSO COORDINATE NECESSARY RELOCATIONS OR OTHER CONSTRUCTION RELATED MATTERS WITH EACH UTILITY.
7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN IN SERVICE ALL EXISTING PIPING ENCOUNTERED DURING CONSTRUCTION UNLESS OTHERWISE INDICATED IN THE DRAWINGS. ANY PIPING WHICH CAN BE REMOVED DURING CONSTRUCTION WITHOUT UNDUE INTERRUPTION OF SERVICE MAY BE REMOVED AND REPLACED BY THE CONTRACTOR WITH THE PERMISSION OF THE OWNER AND THE ENGINEER.
8. TYPICAL DETAILS AS SHOWN ARE TO ILLUSTRATE THE ENGINEER'S INTENT AND ARE NOT PRESENTED AS A SOLUTION TO ALL CONSTRUCTION PROBLEMS ENCOUNTERED IN THE FIELD. THE CONTRACTOR MAY ALTER THE METHOD OF CONSTRUCTION TO SUIT FIELD CONDITIONS, PROVIDING HE SUBMITS A PROPOSAL FOR AN ALTERNATE METHOD TO THE ENGINEER FOR APPROVAL AND USES MATERIALS AS DESIGNATED IN THE SPECIFICATIONS.
9. FOR EACH RESPECTIVE PIPELINE CONSTRUCTION REQUIRED, THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION, DEPTH, AND ALIGNMENT OF ALL EXISTING PIPES, CABLES, ETC. TO BE CROSSED OR CONNECTED TO. IF THE CONTRACTOR DEEMS NECESSARY (A) A CHANGE IN ALIGNMENT OR DEPTH, OR THE NEED FOR ADDITIONAL FITTINGS, BENDS, OR COUPLINGS, WHICH REPRESENT A DEPARTURE FROM THE CONTRACT DRAWING, OR (B) A NEED FOR RELOCATION OF EXISTING UTILITIES, THEN DETAILS OF SUCH DEPARTURES, RELOCATIONS, OR ADDITIONAL FITTINGS, INCLUDING CHANGES IN RELATED PORTIONS OF THE PROJECT AND THE REASONS THEREFORE, SHALL BE SUBMITTED WITH DRAWINGS. APPROVED DEPARTURES FOR THE CONTRACTOR'S CONVENIENCE SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
10. THE CONTRACTOR SHALL PROVIDE AT HIS OWN EXPENSE ALL NECESSARY TEST PUMPING EQUIPMENT, WATER, WASTE METERS, PRESSURE GAUGES, AND OTHER EQUIPMENT, MATERIAL AND FACILITIES REQUIRED FOR ALL HYDROSTATIC, LEAKAGE, AND PRESSURE TESTING. THE CONTRACTOR SHALL CONTACT THE ENGINEER AND THE OWNER IN WRITTEN FORM, FORTY-EIGHT (48) HOURS IN ADVANCE OF PROPOSED TESTING. THE CONTRACTOR SHALL PERFORM SATISFACTORY PRETESTING PRIOR TO NOTIFICATION. THE CONTRACTOR SHALL NOTIFY THE CITY UTILITIES INSPECTOR IN WRITING 48 HOURS IN ADVANCE OF PROPOSED TESTING.
11. THE CONTRACTOR SHALL REFER TO THE CITY OF OCOCEE ENGINEERING STANDARDS, APPROVED MATERIALS LIST, AND DETAILS. THE MOST STRINGENT STANDARDS BETWEEN THE CITY OF OCOCEE AND FDP SHALL BE FOLLOWED FOR ALL PUBLIC UTILITIES.
12. ALL IMPROVEMENTS TO BE DEDICATED AND/OR MAINTAINED BY THE CITY SHALL BE IN CONFORMANCE WITH THE CURRENT CITY OF OCOCEE ENGINEERING STANDARDS MANUAL, MATERIALS LIST, AND DETAILS. ANY DEVIATION FROM THE CITY OF OCOCEE ENGINEERING STANDARDS MUST BE REQUESTED AND APPROVED IN WRITING PRIOR TO CONSTRUCTION.

1. AS-BUILT DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR TO THE ENGINEER THREE WEEKS PRIOR TO FINAL INSPECTION. ALL AS-BUILT DATA SHALL BE PROVIDED BY A FLORIDA LICENSED SURVEYOR, SIGNED, SEALED AND DATED BY THE RESPONSIBLE PARTY.
2. AS BUILT NEED TO BE SUBMITTED TO THE CITY SIGNED AND SEALED IN ACCORDANCE WITH SECTION 3.01.05 OF THE ENGINEERING STANDARD MANUAL IN THE FOLLOWING FORMATS:
 - ONE PDF COPY.
 - ONE CAD COPY DRAWN IN STATE PLANE COORDINATES.

1. UNLESS OTHERWISE DIRECTED BY THE OWNER OR ENGINEER, THE CONTRACTOR IS EXPECTED TO CONTAIN ALL CONSTRUCTION ACTIVITIES AS INDICATED ON THE DRAWINGS. ANY REPAIR OR RECONSTRUCTION OF DAMAGED AREAS SHALL BE REPAIRED BY THE CONTRACTOR ON AN IMMEDIATE BASIS. ALL COSTS FOR REPAIRS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO EXTRA COMPENSATION SHALL BE PROVIDED.
2. STAKE OUT THE CONSTRUCTION, ESTABLISH LINES AND LEVELS, TEMPORARY BENCH MARKS, BATTER BOARDS, CENTERLINES, BASELINES, AND REFERENCE POINTS FOR THE WORK, AND VERIFY ALL DIMENSIONS RELATING TO INTERCONNECTION WITH EXISTING FEATURES. REPORT ANY INCONSISTENCIES IN THE PROPOSED GRADES, LINES AND LEVELS, DIMENSIONS AND LOCATIONS TO THE ENGINEER BEFORE COMMENCING WORK.
3. PROTECT ALL TREES AND SHRUBS, PARTICULARLY THOSE TREES AND SHRUBS LOCATED ADJACENT TO WORK AREAS.
4. TREES TO REMAIN IN THE CONSTRUCTION AREA SHALL BE BOXED, FENCED OR OTHERWISE PROTECTED IN ACCORDANCE WITH DETAILS ON THE DRAWINGS. DO NOT PERMIT HEAVY EQUIPMENT OR STOCKPILES WITHIN BRANCH SPREAD
5. AREAS TO RECEIVE CLEARING AND GRUBBING SHALL INCLUDE ALL AREAS TO BE OCCUPIED BY THE PROPOSED IMPROVEMENTS, AREAS FOR FILL AND SITE GRADING, AND BORROW SITES. REMOVE TREES OUTSIDE OF THESE AREAS ONLY AS INDICATED ON THE DRAWINGS OR AS APPROVED IN WRITING BY THE ENGINEER.
6. CLEARING SHALL CONSIST OF REMOVING TREES AND BRUSH AND DISPOSAL OF OTHER MATERIALS THAT ENCROACH UPON OR OTHERWISE OBSTRUCT THE WORK.
7. EXERCISE EXTREME CARE DURING THE CLEARING AND GRUBBING OPERATIONS. DO NOT DAMAGE EXISTING STRUCTURES, PIPES OR UTILITIES.
8. GRUBBING SHALL CONSIST OF REMOVING AND DISPOSING OF STUMPS, ROOTS LARGER THAN 2" IN DIAMETER, AND MATTED ROOTS. REMOVE TO A DEPTH OF NOT LESS THAN 18" BELOW THE ORIGINAL SURFACE LEVEL OF THE GROUND.
9. ALL COMBUSTIBLE DEBRIS AND REFUSE FROM SITE PREPARATION OPERATIONS SHALL BE REMOVED TO LEGAL OFFSITE DISPOSAL AREAS.

1. THE CONTRACTOR SHALL RECOGNIZE AND ABIDE BY ALL OSHA EXCAVATION SAFETY STANDARDS, INCLUDING THE FLORIDA TRENCH SAFETY ACT (FS 553.60-553.64). ANY MATERIAL, CONSTRUCTION METHODS, OR MATERIAL COST TO COMPLY WITH THESE LAWS SHALL BE INCIDENTAL TO THE CONTRACT.
2. ROUGH EXCAVATE AND GRADE ANY PROPOSED STORMWATER PONDS AT THE START OF SITE GRADING ACTIVITIES. DIRECT SITE RUNOFF TO THE PONDS TO MINIMIZE RUNOFF TO OFFSITE AREAS.
3. POND CONSTRUCTION SHALL RESULT IN THE FINISHED POND HAVING SIDE SLOPES AND DIMENSIONS THAT ARE IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THAT THESE REQUIREMENTS HAVE BEEN MET. IF THE CONSTRUCTED SIDE SLOPES ARE STEEPER THAN THE REQUIRED SIDE SLOPES, OR THE POND VOLUME IS NOT WITHIN THREE (3) PERCENT OF THE DESIGN VOLUME, THE CONTRACTOR MAY BE REQUIRED TO MAKE CORRECTIONS TO THE POND AT NO ADDITIONAL COST TO THE OWNER.
4. FIELD DENSITY TESTING FREQUENCIES: A) ONE TEST FOR EACH 10,000 SQUARE FEET OR FRACTION THEREOF PER LIFT OF GENERAL BACKFILLING, MINIMUM 2 TESTS EACH LAYER; B) ONE TEST FOR EACH 100 CUBIC FEET OF BACKFILL AROUND AND UNDER STRUCTURES; C) ONE TEST FOR EACH 300 LINEAL FEET OR FRACTION THEREOF PER LIFT OF GENERAL BACKFILLING IN THE PIPELINE TRENCH; D) ONE TEST PER LIFT PER EACH CHANGE IN TYPE OF FILL; E) ONE TEST PER 1000 SQUARE FEET OF PAVEMENT SUBGRADE, MINIMUM OF 2 TESTS.
5. IT IS INTENDED THAT PREVIOUSLY EXCAVATED MATERIALS CONFORMING TO THE FOLLOWING REQUIREMENTS BE UTILIZED WHEREVER POSSIBLE.
 - A. ACCEPTABLE MATERIALS: AASHTO M145 CLASSIFICATION A-1, A-3, A-2-4, A-2-6, ASTM D2487 CLASSIFICATION GW, GP, GM, SM, SW, SP; UNLESS OTHERWISE DISAPPROVED WITHIN THE SOIL AND SUBSURFACE INVESTIGATION REPORTS. NO MORE THAN 12% OF ACCEPTABLE MATERIALS SHALL PASS THE NUMBER 200 SIEVE.
 - B. UNACCEPTABLE MATERIALS: AASHTO M145 CLASSIFICATION A-2-5, A-2-7, A-4, A-5, A-6, A-7, A-8; ASTM D2487 CLASSIFICATION GC, SC, ML, MH, CL, CH, OL, OH, PT; UNLESS OTHERWISE APPROVED WITHIN THE SOIL AND SUBSURFACE INVESTIGATION REPORTS.
6. PROVIDE BARRIERS, WARNING LIGHTS AND OTHER PROTECTIVE DEVICES AT ALL EXCAVATIONS.
7. SIDEWALKS, ROADS, STREETS, AND PAVEMENTS SHALL NOT BE BLOCKED OR OBSTRUCTED BY EXCAVATED MATERIALS, EXCEPT AS AUTHORIZED BY THE ENGINEER, IN WHICH CASE ADEQUATE TEMPORARY PROVISIONS MUST BE MADE FOR SATISFACTORY TEMPORARY PASSAGE OF PEDESTRIANS, AND VEHICLES. MINIMIZE INCONVENIENCE TO PUBLIC TRAVEL OR TO TENANTS OCCUPYING ADJOINING PROPERTY.
8. FURNISH, INSTALL, AND MAINTAIN, WITHOUT ADDITIONAL COMPENSATION, SHEETING, BRACING, AND SHORING SUPPORT REQUIRED TO KEEP EXCAVATIONS WITHIN THE PROPERTY OR EASEMENTS PROVIDED, TO SUPPORT THE SIDES OF THE EXCAVATION, AND TO PREVENT ANY MOVEMENT WHICH MAY DAMAGE ADJACENT PAVEMENTS OR STRUCTURES, DAMAGE OR DELAY THE WORK, OR ENDANGER LIFE AND HEALTH. VOIDS OUTSIDE THE SUPPORTS SHALL BE IMMEDIATELY FILLED AND COMPACTED.
9. SHEETING, SHORING, AND BRACING USED FOR THE SUPPORT OF EXCAVATIONS OVER 20 FEET DEEP SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF FLORIDA.
10. ALL EXCAVATIONS SHALL BE MADE BY OPEN CUT UNLESS OTHERWISE INDICATED. SLOPE SIDES OF TRENCHES IN ACCORDANCE WITH OSHA REQUIREMENTS AND THE RECOMMENDATIONS CONTAINED WITHIN THE PROJECT GEOTECHNICAL REPORT.
11. EXCAVATE TRENCHES TO DEPTH INDICATED OR REQUIRED FOR INDICATED FLOW LINES AND INVERT ELEVATIONS. OVER EXCAVATE TRENCHES A MINIMUM OF 2 FEET WHERE EXCAVATIONS OCCUR WITHIN UNSUITABLE SOILS, AND REPLACE OVER EXCAVATED MATERIAL WITH SUITABLE SOILS.
12. EXCEPT AS OTHERWISE INDICATED, EXCAVATE FOR PRESSURE PIPING SO TOP OF PIPING IS MINIMUM 3 FEET BELOW FINISHED GRADE.
13. TRENCH BOTTOMS AND THE BOTTOMS OF ALL STRUCTURES SHALL BE KEPT DRY, COMPACTED, AND STABLE TO A DEPTH TWO FEET BELOW THE BOTTOM OF THE TRENCH OR STRUCTURE.
14. ALL BEDDING, FILL, AND BACKFILL MATERIAL SHALL BE SUITABLE SOILS OR FLOWABLE FILL. WHERE TRENCH OR EXCAVATION IS WITHIN THE INFLUENCE AREA OF ROADWAYS, STRUCTURES, FOUNDATIONS, OR SLABS, PLACE BACKFILL IN LAYERS OF 8 INCH LOOSE DEPTH. IN ALL OTHER AREAS, PLACE FILL AND BACKFILL IN LAYERS OF 12 INCH LOOSE DEPTH.
15. MINIMUM DENSITY REQUIREMENT (ASTM D1557 OR AASHTO T180): BACKFILL AND FILL UNDER AND WITHIN THE INFLUENCE AREA OF ROADWAYS, STRUCTURES, SLABS, FOUNDATIONS = 98 PERCENT; BACKFILL AND FILL PLACED WITHIN PUBLIC ROAD RIGHT-OF-WAY AND UTILITY EASEMENTS = 95 PERCENT; BACKFILL AND FILL PLACED WITHIN POND AND ROAD EMBANKMENT = 95 PERCENT; BACKFILL AND FILL PLACED IN ALL OTHER AREAS = 90 PERCENT.

1. THE MOST STRINGENT STANDARDS BETWEEN THE CITY OF OCOEE AND FDEP STANDARDS SHALL BE FOLLOWED FOR ALL PUBLIC UTILITIES.

2. THE HORIZONTAL SEPARATION BETWEEN WATER MAINS AND SANITARY SEWER, STORM SEWER, WASTEWATER FORCE MAINS, STORMWATER FORCE MAINS, RECLAIMED WATER MAINS AND ONSITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

- A. THE OUTSIDE OF WATER MAINS SHALL BE A MINIMUM OF THREE FEET FROM THE OUTSIDE OF ANY EXISTING OR PROPOSED STORM SEWER, STORMWATER FORCE MAIN, VACUUM TYPE SANITARY SEWER, AND RECLAIMED WATER MAIN.
- B. THE OUTSIDE OF WATER MAINS SHALL BE A MINIMUM OF TEN FEET FROM THE OUTSIDE OF ANY EXISTING OR PROPOSED GRAVITY SANITARY SEWER AND WASTEWATER FORCE MAIN. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN THE OUTSIDE OF WATER MAINS AND THE OUTSIDE OF GRAVITY SANITARY SEWERS CAN BE REDUCED TO THREE FEET WHERE THE BOTTOM OF THE WATER MAIN IS AT LEAST SIX INCHES ABOVE THE TOP OF THE SEWER.
- C. THE OUTSIDE OF WATER MAINS SHALL BE A MINIMUM OF TEN FEET FROM ALL PARTS OF ANY EXISTING OR PROPOSED ONSITE SEWAGE TREATMENT AND DISPOSAL SYSTEM SUCH AS SEPTIC TANKS, DRAINFIELDS, AND GREASE TRAPS. ONSITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS DO NOT INCLUDE PACKAGE SEWAGE TREATMENT FACILITIES AND PUBLIC WASTEWATER TREATMENT FACILITIES.

3. THE VERTICAL SEPARATION BETWEEN WATER MAINS AND SANITARY AND STORM SEWER, WASTEWATER OR STORMWATER FORCE MAINS, AND RECLAIMED WATER MAINS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

- A. WHEREVER POSSIBLE, WATER MAINS SHALL CROSS OVER EXISTING OR PROPOSED GRAVITY SANITARY SEWER, VACUUM TYPE SANITARY SEWER, AND STORM SEWER, SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST EIGHTEEN INCHES ABOVE THE OUTSIDE OF THE SEWER. WHERE IT IS NOT POSSIBLE FOR THE WATER MAIN TO CROSS OVER EXISTING OR PROPOSED GRAVITY SANITARY SEWER, VACUUM TYPE SANITARY SEWER, AND STORM SEWER, THEN THE WATER MAIN CAN CROSS UNDER THESE TYPES OF PIPELINE SYSTEMS PROVIDED THE OUTSIDE OF THE WATER MAIN IS AT LEAST 12 INCHES BELOW THE OUTSIDE OF THE PIPELINE. AT THE CROSSING, THE PROPOSED PIPE JOINTS SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM VACUUM TYPE SANITARY SEWER OR STORM SEWER JOINTS, AND AT LEAST SIX FEET FROM GRAVITY SANITARY SEWER JOINTS.
- B. WHEREVER POSSIBLE, WATER MAINS SHALL CROSS OVER EXISTING OR PROPOSED RECLAIMED WATER MAINS, WASTEWATER FORCE MAINS AND STORMWATER FORCE MAINS. WHETHER THE WATER MAIN CROSSES OVER OR UNDER THESE TYPES OF PIPELINE SYSTEMS, THE OUTSIDE OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES FROM THE OUTSIDE OF THE EXISTING OR PROPOSED RECLAIMED WATER MAIN, WASTEWATER FORCE MAIN AND STORMWATER FORCE MAIN. AT THE CROSSING, THE PROPOSED PIPE JOINTS SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM RECLAIMED WATER MAIN JOINTS AND STORMWATER FORCE MAIN JOINTS, AND AT LEAST SIX FEET FROM THE JOINTS OF WASTEWATER FORCE MAINS.

4. WHERE SEPARATION IN ACCORDANCE WITH CITY OF OCOEE DETAIL U013 CAN NOT BE MET, A LESSER SEPARATION IN ACCORDANCE WITH 62.555.314 MAY BE ALLOWED.

AN EROSION CONTROL PLAN SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL EXECUTE ALL MEASURES NECESSARY TO LIMIT THE TRANSPORT OF SEDIMENTS OUTSIDE THE LIMITS OF THE PROJECT TO THE VOLUME AND AMOUNT AS THAT ARE EXISTING PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. PERMITS REQUIRED MUST BE MADE TO PRESERVE THE INTEGRITY AND CAPACITY OF CHECK WEIRS, SEDIMENT BASINS, SLOPE DRAINS, GRADING PATTERNS, ETC. REQUIRED TO MEET THIS PROVISION THROUGHOUT THE LIFE OF THE CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE HAY BALES, SILT BARRIERS, TEMPORARY GRASSING, ETC. AS REQUIRED TO FULLY COMPLY WITH THE INTENT OF THIS SPECIFICATION.

A) STOCKPILING MATERIAL
NO EXCAVATED MATERIAL SHALL BE STOCKPILED IN SUCH A MANNER AS TO DIRECT RUNOFF DIRECTLY OFF THE PROJECT SITE OR INTO ANY ADJACENT WATER BODY OR STORMWATER COLLECTION FACILITY.

B) EXPOSED AREA LIMITATION
THE SURFACE AREA OF OPEN, RAW ERODABLE SOIL EXPOSED BY CLEARING AND GRUBBING OPERATIONS OR EXCAVATION AND FILLING OPERATIONS SHALL BE CONTROLLED, SO THAT THIS OPERATION WILL NOT SIGNIFICANTLY AFFECT OFFSITE DEPOSIT SEDIMENTS.

C) INLET PROTECTION
DITCHES AND CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT LADEN STORM WATER RUNOFF UNTIL THE COMPLETION OF THE ALL CONSTRUCTION OPERATIONS THAT MAY CONTRIBUTE SEDIMENT TO THE INLET.

D) TEMPORARY SEEDING
AREAS OPENED BY CONSTRUCTION OPERATIONS THAT ARE NOT ANTICIPATED TO BE DRESSED OR RECEIVE FINAL GRASSING TREATMENT WITHIN THIRTY (30) DAYS SHALL BE SEEDDED WITH A QUICK GROWING GRASS SPECIES WHICH WILL PROVIDE AND EARLY COVER, DURING THE SEASON IN WHICH IT IS PLANTED. TEMPORARY SEEDING SHALL BE CONTROLLED SO AS TO NOT ALTER OR COMPLETE WITH PERMANENT GRASSING. THE RATE OF SEEDING SHALL BE 30 POUNDS PER ACRE.

E) TEMPORARY SEEDING AND MULCHING
SLOPES STEEPER THAN 6:1 THAT FALL WITHIN THE CATEGORY ESTABLISHED IN 4 ABOVE, SHALL ADDITIONALLY RECEIVE MULCHING OF APPROXIMATELY TWO (2) INCHES, LOOSE MEASURE, OF MULCH MATERIAL CUT INTO THE SOIL OF THE SEEDDED AREA TO A DEPTH OF FOUR (4) INCHES.

F) TEMPORARY GRASSING
THAT SEEDDED OR SEEDDED AND MULCHED AREA(S) SHALL BE ROLLED AND WATERED AS REQUIRED TO ASSURE OPTIMUM GROWING CONDITIONS FOR THE ESTABLISHMENT OF A GOOD GRASS COVER.

G) TEMPORARY RE-GRASSING
IF, AFTER 14 DAYS, THE TEMPORARY GRASSED AREAS HAVE NOT ATTAINED A MINIMUM OF 75% GOOD GRASS COVER, THE AREA WILL BE REWORKED AND ADDITIONAL SEEDS APPLIED TO ESTABLISH THE DESIRED VEGETATION COVER.

H) MAINTENANCE
ALL FEATURES OF THE PROJECT SHALL BE CONSTRUCTED TO PREVENT EROSION AND SEDIMENT AND SHALL BE MAINTAINED DURING THE LIFE OF THE CONSTRUCTION SO AS TO FUNCTION PROPERLY WITHOUT THE TRANSPORT OF SEDIMENTS OUTSIDE THE LIMITS OF THE PROJECT.

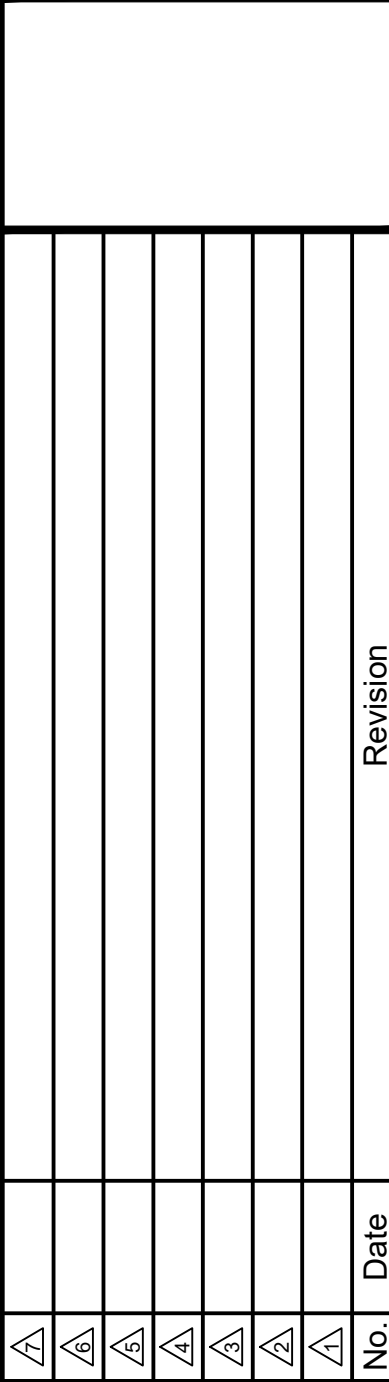
2. TEMPORARY SILT FENCES AND STAKED SILT BARRIERS, SHALL BE IN ACCORDANCE WITH F.D.O.T. STANDARD SPECIFICATION, SEC. 104.6, 104.7 AND SEC. 985.

3. THE CONTRACTOR SHALL PREPARE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH THE EPA NPDES (NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM) REGULATIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR MUST ALSO PREPARE AND SUBMIT A NOTICE OF INTENT (NOI) FORM TO FDEP 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.

4. UNDER PROVISIONS OF THE CLEAN WATER ACT, OPERATOR(S) OF CONSTRUCTION SITES, PURSUANT TO CONDITIONS OF THE NPDES PERMIT, MUST SUBMIT A NOI TO OBTAIN COVERAGE UNDER THE NPDES STORM WATER CONSTRUCTION GENERAL PERMIT.

5. NOIS MUST BE SENT TO THE FOLLOWING ADDRESS:
NPDES STORMWATER PROGRAM
2600 BLAIR STONE ROAD
MAIL STATION 2500
TALLAHASSEE, FL 32399
PHONE: (850) 245-7522
UPON SUBMITTAL TO FDEP IN TALAHASSEE, THE CONTRACTOR SHALL ALSO SUBMIT A COPY TO THE CITY ENGINEER.

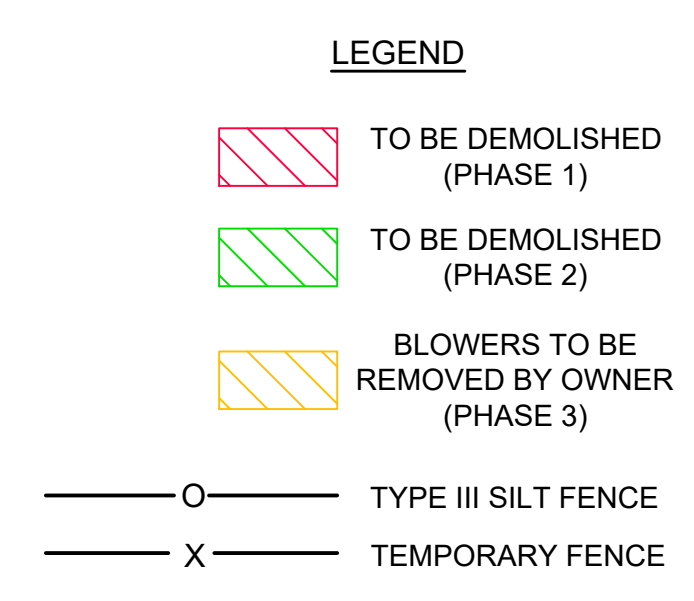
SHEET NO.	SHEET TITLE
CIVIL	
C-1	COVER
C-2	GENERAL NOTES & SHEET INDEX
C-3	DEMOLITION PLAN
C-4	PROPOSED SITE PLAN
C-5	GRADING PLAN
C-6	DETAILS
C-7	DETAILS
C-8	DETAILS
SURVEY	
V0.1	SURVEY COVER
V1.1	TOPOGRAPHIC SURVEY
ARCHITECTURE	
G001	NOTES AND DRAWING CONVENTIONS
G002	GENERAL INFORMATION AND ABBREVIATIONS
G101	LIFE SAFETY PLAN
A101	ARCHITECTURAL FLOOR PLAN AND SCHEDULES
A102	FLOOR PLAN - OPERATION BUILDING
A151	ROOF PLAN AND DETAILS
A201	EXTERIOR ELEVATIONS
A351	WALL SECTIONS
A521	DETAILS - EXTERIOR
STRUCTURAL	
S001	GENERAL NOTES
S100	FOUNDATION PLAN & SECTIONS
S110	FOUNDATION PLAN - GENERATOR, BLOWER & CABLE TRAY PAD
S200	FRAMING PLAN & SECTIONS
S300	TYPICAL C.M.U. SECTIONS AND DETAILS
ELECTRICAL	
E-01	ABBREVIATIONS
E-02	SYMBOLS
E-03	SITE PLAN
E-04	PARTIAL SITE PLAN 1
E-05	PARTIAL SITE PLAN 2
E-06	480V POWER RISER
E-07	MCC-1 POWER RISER
E-08	MCC-2 POWER RISER
E-09	MCC CONTROL DIAGRAMS
E-10	PLANT SCADA SYSTEM
E-11	PANEL SCHEDULES
E-12	BLOWER PLAN
E-13	ELECTRICAL ROOM PLAN
E-14	ELECTRICAL BUILDING LIGHTING PLAN
E-15	ELECTRICAL BUILDING POWER PLAN
E-16	PRETREATMENT PLAN
E-17	DUCT BANK SECTIONS
E-18	PROJECT PHOTOS
E-19	PROJECT PHOTOS
E-20	DETAILS
HVAC	
H-1	ELECTRICAL BUILDING HVAC PLAN



GENERAL NOTES & SHEET INDEX

WWTF ELECTRICAL UPGRADE AND EXPANSION
Ocoee, Florida

Sheet No.
C-2



[illegible]

Designed:	MEI	
Drawn:	DGH	
Checked:	RMG	
Job No.:	O6023	
Date:	10/17/23	© 2023

PROPOSED SITE PLAN

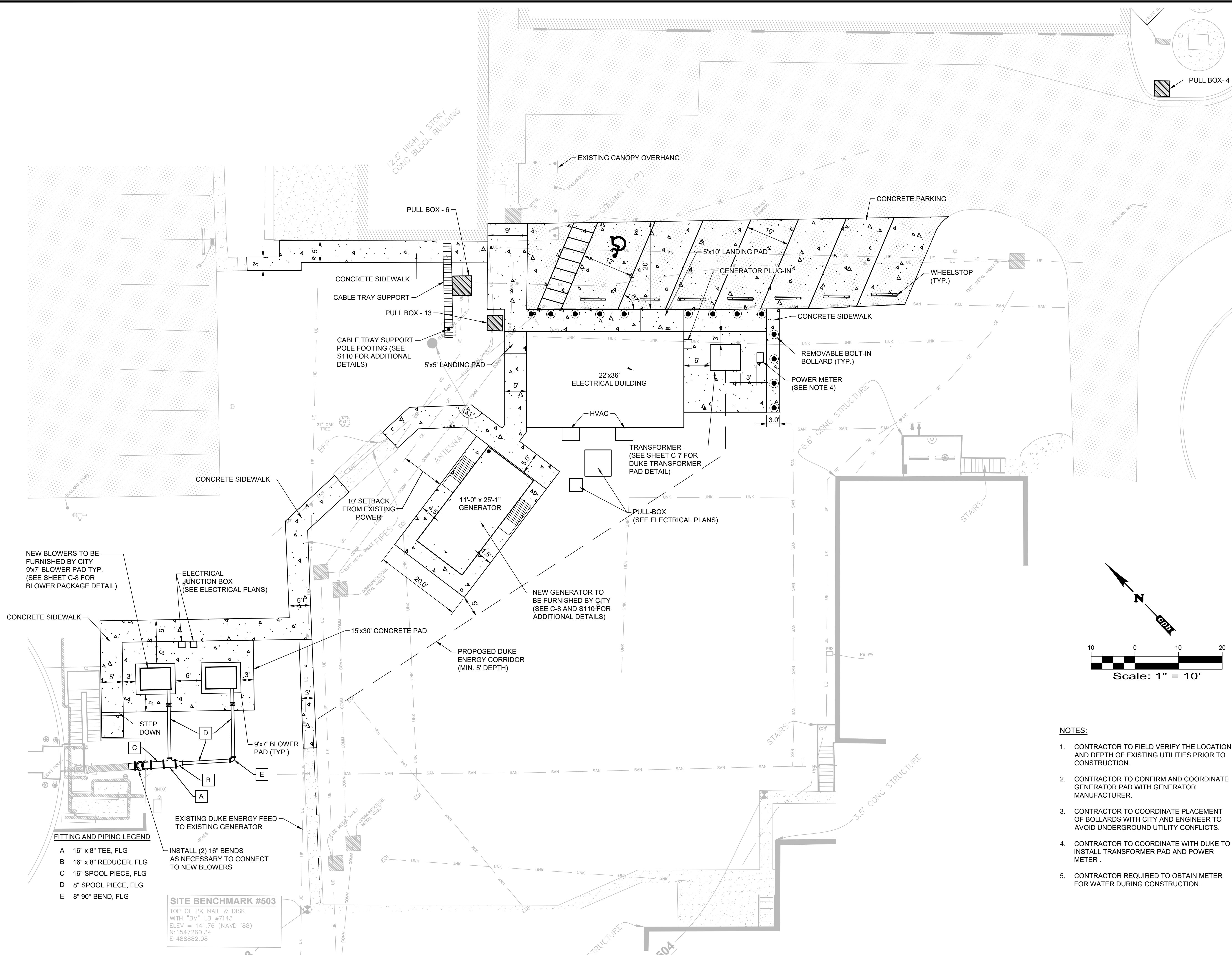
WWTF ELECTRICAL UPGRADE AND EXPANSION

Ocoee, Florida

THIS SHEET NOT VALID FOR
CONSTRUCTION WITHOUT
COMPLETE SET OF PLANS

Sheet No.
C-4

BID SET



NOTES:

1. CONTRACTOR TO FIELD VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO CONFIRM AND COORDINATE GENERATOR PAD WITH GENERATOR MANUFACTURER.
3. CONTRACTOR TO COORDINATE PLACEMENT OF BOLLARDS WITH CITY AND ENGINEER TO AVOID UNDERGROUND UTILITY CONFLICTS.
4. CONTRACTOR TO COORDINATE WITH DUKE TO INSTALL TRANSFORMER PAD AND POWER METER .
5. CONTRACTOR REQUIRED TO OBTAIN METER FOR WATER DURING CONSTRUCTION.

[illegible]

Designed:	MEI	
Drawn:	DGH	
Checked:	RMG	
Job No.:	O6023	
Date:	10/17/23	© 2023

DETAILS

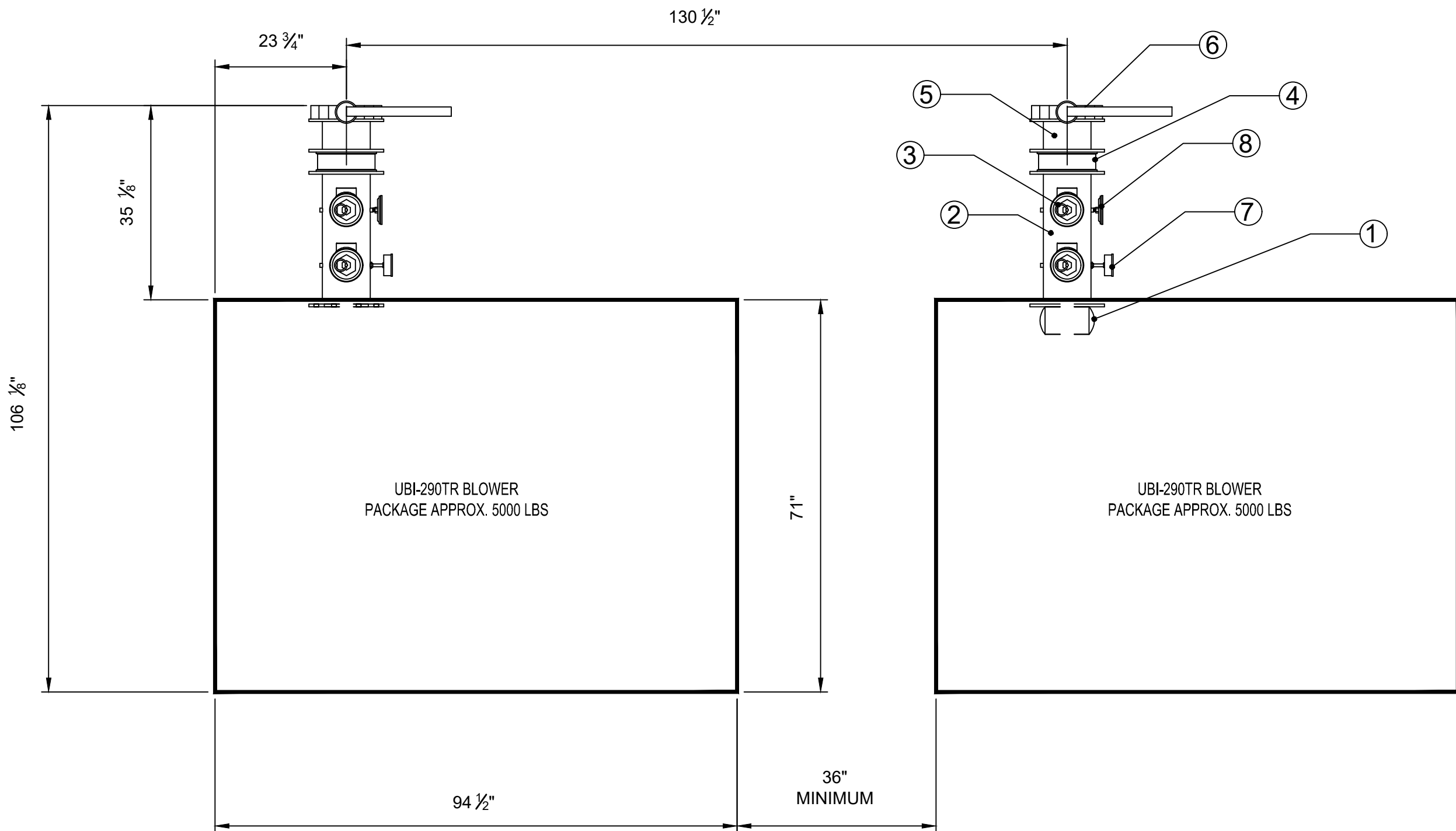
WWTF ELECTRICAL UPGRADE AND EXPANSION

THIS SHEET NOT VALID FOR
CONSTRUCTION WITHOUT
COMPLETE SET OF PLANS

Sheet No.
C-8

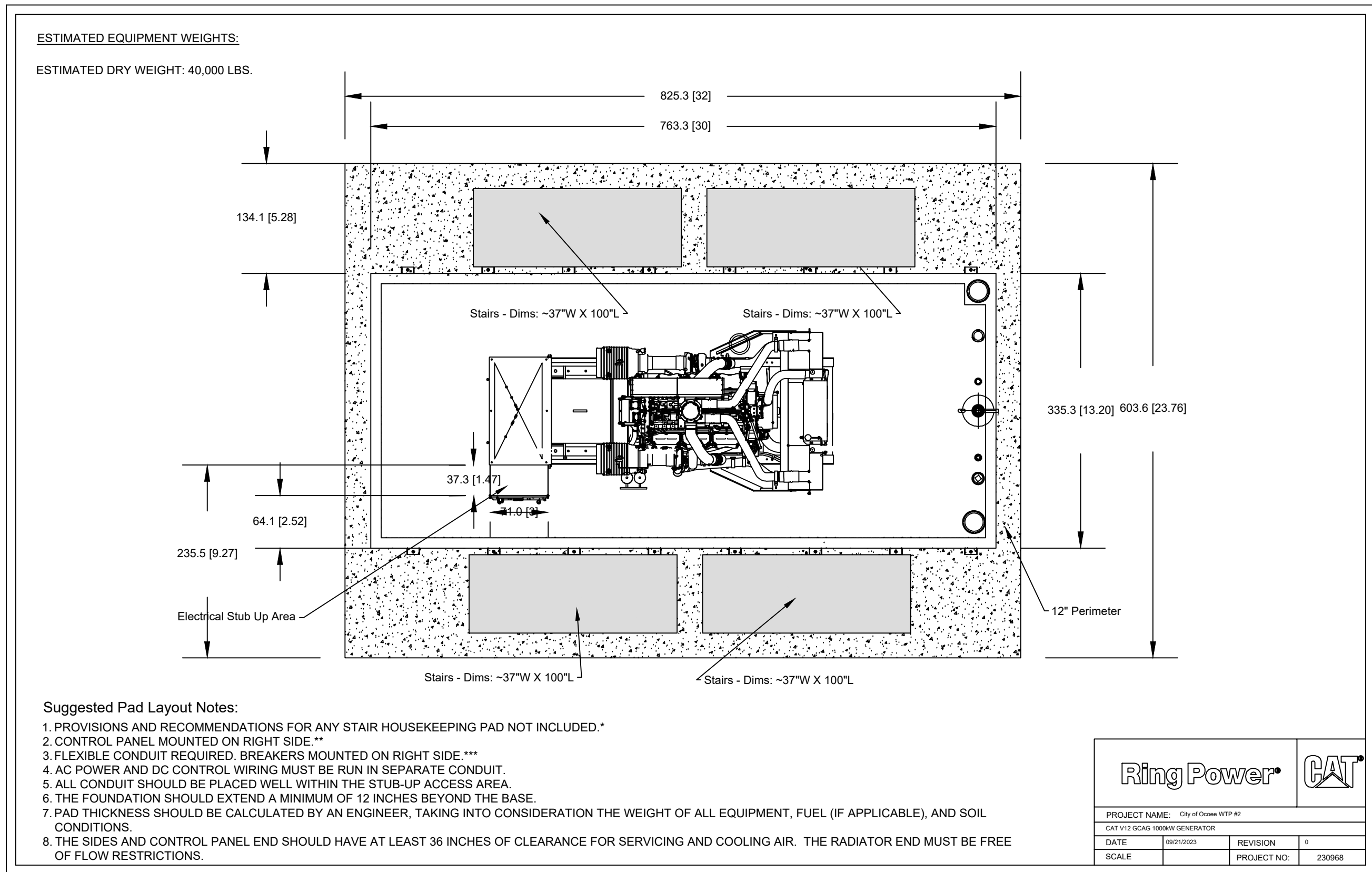
BID SET

- ① 8" EXPANSION JOINT
- ② 8" DISCHARGE SPOOL
- ③ (2) 2.5" SPRING RELIEF VALVE
- ④ 8" CHECK VALVE
- ⑤ 8" SPACER SPOOL
- ⑥ 8" BUTTERFLY VALVE
- ⑦ PRESSURE GAUGE
- ⑧ TEMPERATURE GAUGE



BLOWER PACKAGE DETAIL

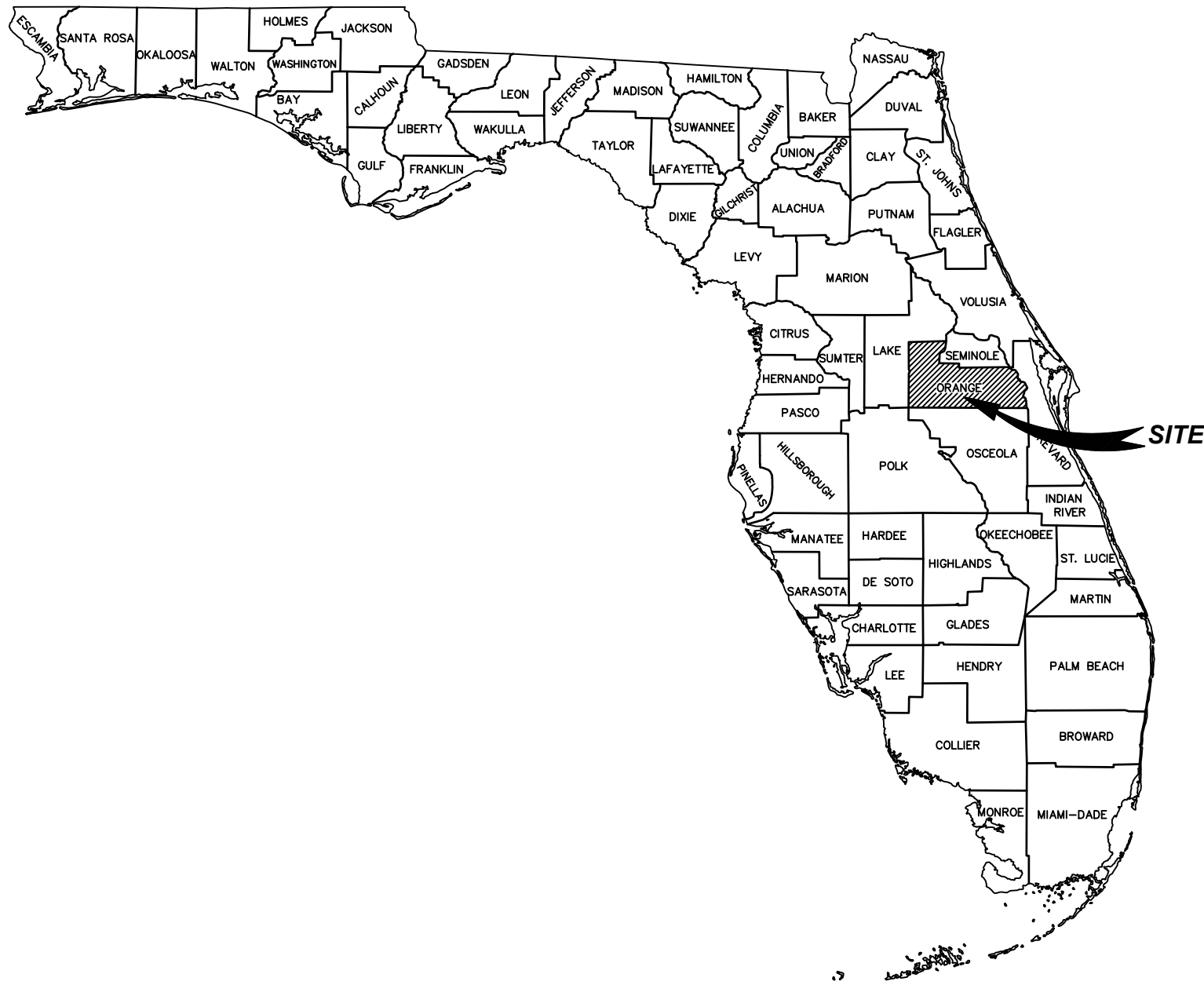
NOT TO SCALE



NOTE: SEE SHEET S110, DETAIL- FI FOR PAD DIMENSIONS

GENERATOR DETAIL (PER CATERPILLAR)

NOT TO SCALE

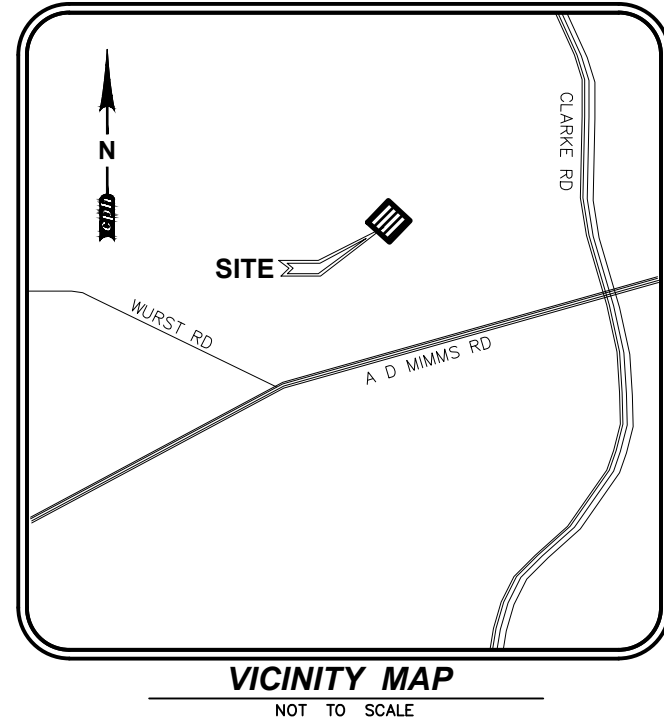


TOPOGRAPHIC SURVEY
FOR
CITY OF OCOEE
AT
1820 A D MIMMS ROAD
LYING IN
SECTION 9-TOWNSHIP 22 SOUTH-RANGE 28 EAST
ORANGE COUNTY, FLORIDA

Topographic Survey Area:

A PORTION OF 1820 A D MIMMS ROAD AS REQUESTED BY THE CLIENT.

Survey Sheet 1



cph
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**A Full Service
A & E Firm**
500 West Fulton Street
Sanford, FL 32771
Ph: 407.322.6841
Plans Prepared By:
CPH, LLC
State of Florida Licenses:
Engineer No. 3215
Surveyor No. LB7143
Architect No. AA26000926
Landscape No. LC000298



Survey Notes:

- COPIES OF THIS SURVEY ARE NOT VALID WITHOUT THE ORIGINAL SIGNATURE AND SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
- ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.
- THIS SURVEY IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)
THE SITE BENCHMARKS FOR THIS TOPOGRAPHIC SURVEY ARE DISPLAYED ON THE RESPECTIVE SURVEY FILE. THESE BENCHMARKS ARE BASED ON A CLOSED VERTICAL CONTROL LOOP HAVING AN ACTUAL ERROR OF CLOSURE OF 0.005' WHICH MEETS THE ALLOWABLE CLOSURE OF 0.026'. THIS FIELDWORK WAS PERFORMED USING A TOPCON LEVEL MODEL # DL-502 AND REFERENCES THE FOLLOWING PUBLISHED BENCHMARK AS ESTABLISHED BY THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) AND ALL VERTICAL INFORMATION INCLUDING SPOT ELEVATIONS, NOTATIONS AND THE CONTOUR LINES DERIVED THEREFROM ARE BASED ON AND MATCHED TO A VERTICAL CONTROL BENCHMARK SUPPLIED BY ORANGE COUNTY AS FOLLOWS:
a) POINT NAME: S766009
(NAVD '88) ELEVATION = 145.877
SITE BENCHMARKS ARE AS SHOWN ON SURVEY SHEET 2 OF 2.
- THIS SURVEY IS NOT VALID WITHOUT SURVEY SHEETS 1 THROUGH 2 OF 2.
- THE LAST DAY FIELD WORK WAS PERFORMED WAS 6/17/2022.

- HAVING CONSULTED THE NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP (FIRM) NUMBER 12095C0210H, COMMUNITY PANEL NO. 120185-0210-H, CITY OF OCOEE, REVISED DATE SEPTEMBER 24, 2021, THE SUBJECT PROPERTY APPEARS TO LIE IN ZONE X, WHICH ARE AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN (NAVD '88). THIS DETERMINATION WAS BASED ON A GRAPHIC INTERPOLATION OF SAID MAP AND NOT ON ACTUAL FIELD MEASUREMENTS.
- HORIZONTAL WELL-IDENTIFIED FEATURES IN THIS SURVEY AND MAP HAVE BEEN MEASURED TO AN ESTIMATED HORIZONTAL POSITIONAL ACCURACY OF 0.05 (FT). THE EQUIPMENT USED TO VERIFY THE HORIZONTAL CONTROL ON THE SUBJECT SURVEY WAS A TOPCON GPS HIPER VR, THE EQUIPMENT USED TO LOCATE THE FEATURES WAS A LEICA SCANSTATION P40 AND TOPCON GPS HIPER VR.
- NO UNDERGROUND UTILITIES, FOUNDATIONS OR IMPROVEMENTS, IF ANY, HAVE BEEN LOCATED EXCEPT AS SHOWN.
- THIS SURVEY DOES NOT IDENTIFY THE LIMITS OR EXTENT OF POTENTIAL JURISDICTIONAL WETLAND BOUNDARIES.

- VERTICAL FEATURE ACCURACY: "ELEVATIONS OF WELL-IDENTIFIED FEATURES CONTAINED IN THIS SURVEY AND MAP HAVE BEEN MEASURED TO AN ESTIMATED VERTICAL POSITIONAL ACCURACY OF 0.05 (FT)."
- STATE PLANE INFORMATION SHOWN HEREON IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (1990) USING CONTROL POINTS FROM THE NGS DATA SHEETS PUBLISHED FLORIDA DEPARTMENT OF TRANSPORTATION AND ARE AS FOLLOWS:
FLORIDA EAST ZONE

- POINT NAME: 7502K004 = N 1,540,135.219 FEET, E 474,184.474 FEET
- POINT NAME: 7502K013 = N 1,541,693.304 FEET, E 490014.104 FEET
THE EQUIPMENT USED TO TRANSFER THE STATE PLANE INFORMATION FROM THE ABOVE REFERENCED CONTROL POINTS TO THE SUBJECT SURVEY WAS A TOPCON GPS HIPER VR.
- DIMENSIONS ARE SHOWN RELATIVE TO UNITED STATES STANDARD FEET AND DECIMALS THEREOF, UNLESS THE OBJECT SHOWN IS COMMONLY IDENTIFIED IN INCHES, I.E. TREE DIAMETER, PIPE DIAMETER, ETC. TREES DEPICTED ARE COMMON NAMES AND MEASURED AND LABELED AS DIAMETER AT BREAST HEIGHT IN INCHES.
- THE UNDERGROUND UTILITIES LABELED UE, COMM UNK AND THE SANITARY LATERAL LINES DISPLAYED ON SURVEY SHEET 2 OF 2 ARE A RESULT OF AN ELECTRONIC FILE CREATED BY SOUTHEASTERN SURVEYING & MAPPING CORP. (6500 ALL AMERICAN BOULEVARD, ORLANDO FL 32810, [407] 292-8580) AND MATCHED TO DIAGRAMS AND DETAIL SHEETS PREPARED BY SOUTHEASTERN SURVEYING & MAPPING CORP.

Abbreviation Legend:

(A)	ACTUAL	MBX	MAILBOX
A/C	AIR CONDITIONER	MES	MITERED END SECTION
ACSM	AMERICAN CONGRESS ON SURVEYING & MAPPING	MH	MANHOLE
ADA	AMERICANS WITH DISABILITIES ACT	MLP	METAL LIGHT POLE
ALTA	AMERICAN LAND TITLE ASSOCIATION	MPH	MILES PER HOUR
APPROX	APPROXIMATE	MPP	METAL POWER POLE
ARV	AIR RELEASE VALVE	N/A	NOT APPLICABLE
AVE	AVENUE	NAVD	NORTH AMERICAN VERTICAL DATUM
AVG	AVERAGE	NAD	NORTH AMERICAN DATUM
(BB)	BEARING BASIS	NO	NATURAL GROUND
BFP	BACK FLOW PREVENTER	NGS	NATIONAL GEODETIC SURVEY
BLK	BLOCK	NGVD	NATIONAL GEODETIC VERTICAL DATUM
BLDG	BUILDING	NO	NUMBER
BLVD	BOULEVARD	NR	NON-RADIAL
BM	BENCH MARK	NSPS	NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS
BOC	BACK OF CURB	NT	NON-TANGENT
BOW	BACK OF WALK	NTS	NOT TO SCALE
BSL	BUILDING SETBACK LINE	OD	OUTSIDE DIAMETER
BWF	BARBED WIRE FENCE	OR	OFFICIAL RECORDS BOOK
C-X	DENOTES SHEET NUMBERING FOR ENGINEERING PLANS	OUL	OVERHEAD UTILITY LINES
(C)	CALCULATED	(P)	OVERHEAD TRAFFIC LINES
CATV	CABLE TELEVISION RISER	PB	PLAT BOOK
CB	CHORD BEARING	PC	POINT OF CURVATURE
CBS	CONCRETE BLOCK STRUCTURE	PC	POINT OF COMPOUND CURVATURE
C.C.R.	CERTIFIED CORNER RECORD	PCP	PERMANENT CONTROL POINT
C&G	CURB & GUTTER	PFF	PROPOSED FINISHED FLOOR
CI	CATCH INLET	PGS	PAGES
C/L	CENTERLINE	PI	POINT OF INTERSECTION
CLF	CHAIN LINK FENCE	Piv	POST INDICATOR VALVE
CM	CONCRETE MONUMENT	POB	POINT OF BEGINNING
CMP	CORRUGATED METAL PIPE	POC	POINT OF COMMENCEMENT
CO	CLEANOUT	PP	POINT ON LINE
CONC	CONCRETE	PRC	POINT OF REVERSE CURVATURE
COR	CORNER	PRM	PERMANENT REFERENCE MONUMENT
CRPP	CORRUGATED PLASTIC PIPE	PSM	PROFESSIONAL SURVEYOR & MAPPER
CUE	COUNTY UTILITY EASEMENT	PT	POINT OF TANGENCY
CVS	CAN'T VERIFY SIZE	PVC	POLYVINYL CHLORIDE PIPE
CVS&T	CAN'T VERIFY SIZE & TYPE	PVMT	PAVEMENT
CWS	CROSSWALK SIGNAL	R28E	RANGE 28 EAST
Δ	DELTA	R	RADIUS
(D)	DESCRIPTION	RAD	RADIAL
DBH	DIAMETER AT BREAST HEIGHT IN INCHES	RCP	REINFORCED CONCRETE PIPE
DE	DRAINAGE EASEMENT	REC	RECOVERED
DEPT	DEPARTMENT	REV	REVISION
DIP	DUCTILE IRON PIPE	RP	RADIUS POINT
DR	DRIVE	R/W	RIGHT-OF-WAY
D/U	DRAINAGE AND UTILITY EASEMENT	RLS	REGISTERED LAND SURVEYOR
(E)	ENGINEERING PLAN	RP	RADIUS POINT
EJB	ELECTRIC JUNCTION BOX	RW	UNDERGROUND RECLAIM WATER LINE
EL	UNDERGROUND ELECTRICAL LINES	RWM	RECLAIMED WATER METER
ELEC	ELECTRIC	SEC	SPECIAL EASEMENT
ELEV	ELEVATION	SEC 9	SECTION 9
ELLIP	ELLIPTICAL	SMH	SANITARY SEWER MANHOLE
EOP	END OF INFORMATION	(SP)	STATE PLANE
EOI	EDGE OF PAVEMENT	SQ	SQUARE
FB	FIELD BOOK	SQ FT	SQUARE FEET
FDC	FIRE DEPARTMENT CONNECTION	ST	STREET
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION	STMH	STORM DRAINAGE MANHOLE
FGI	FLAT GRATE INLET	ST	STREET
FGLP	FIBERGLASS LIGHT POLE	S/W	SIDE WALK
FHYD	FIRE HYDRANT	TB	TANGENT BEARING
FM	FORCE MAIN	T22S	TOWNSHIP 22 SOUTH
FND	FOUND	TELE	TELEPHONE
FP&L	FLORIDA POWER AND LIGHT	TOB	TOP OF BANK
FS	FLORIDA STATUTES	TOE	TOE OF SLOPE
(G)	GRID (STATE PLANE)	TOE	TOE OF SLOPE
GL	UNDERGROUND GAS LINES	TR	TELEPHONE RISER
GOV/T	GOVERNMENT	TRANS	TRANSFORMER
GPR	GROUND PENETRATING RADAR	TSB	TRAFFIC SIGNAL BOX
GTMH	GREASE TRAP MANHOLE	TSPP	TRAFFIC SIGNAL SUPPORT POLE
HDPE	HIGH DENSITY POLYETHYLENE PIPE	TVL	UNDERGROUND CABLE TV LINES
HWF	HOG WIRE FENCE	(TYP)	TYPICAL
ID	IDENTIFICATION	UE	UTILITY EASEMENT
ICV	IRRIGATION CONTROL VALVE	UNK	UNKNOWN
INV	INVERT	UTL	UNDERGROUND TELEPHONE LINES
IP	IRON PIPE	W/	WITH
IP&C	IRON PIPE & CAP	WIF	WROUGHT IRON FENCE
IR	IRON ROD	WL	UNDERGROUND WATER LINE
IR&C	IRON REBAR & CAP	WM	WOOD LIGHT POLE
IRR	IRRIGATION	WP	WOOD POWER POLE
L	ARC LENGTH	WPP	WOOD POWER POLE
LB#	LICENSED BUSINESS NUMBER	WV	WATER VALVE
LP	LIGHT POLE		
(M)	MEASURED		
MB	MAP BOOK		

Line Legend:

NOT TO SCALE	
---	= 1 FOOT CONTOURS
---	= 5 FOOT CONTOURS
---	= ADJOINER PROPERTY LINES
-x-x-	= BARBED WIRE FENCE
---	= BROKEN LINE
---	= PLAT
---	= BURIED CABLE
---	= BURIED CABLE TELEVISION
---	= BURIED ELECTRIC
---	= BURIED FIBER OPTICS
---	= BURIED GAS
---	= BURIED RECLAIMED WATER LINE
---	= BURIED SANITARY LINES
---	= BURIED SANITARY SEWER FORCE MAIN LINE
---	= BURIED TRAFFIC CONTROL
---	= BURIED TELEPHONE LINE
---	= BURIED WATER LINES
---	= CENTER LINE R/W
---	= CHAIN LINK FENCE
---	= EASEMENT LINES (EXISTING)
---	= EASEMENT LINES (PROPOSED)
---	= EDGE OF WATER LINES
---	= EXISTING DRAINAGE PIPES
---	= EXISTING DRAINAGE PIPES
---	(TERMINUS & ANGLE UNKNOWN)
---	= FIRE WATER MAIN LINES
---	= HOT WATER SUPPLY LINES
---	= IRRIGATION LINES
---	= OVERHEAD TRAFFIC LINES
---	= OVERHEAD UTILITY LINES
---	= RAILROAD TRACKS
---	= RIGHT-OF-WAY LINES
---	= SECTION LINES
---	= STONE WALL LINES
---	= TOP OF BANK LINES
---	= TOE OF SLOPE LINES
---	= TRVERSE LINES
---	= UNKNOWN BURIED LINES
---	= VINYL FENCE
---	= WETLAND LINE
---	= ORANGE PAINT LINE
---	= GREEN PAINT LINE
---	= RED PAINT LINE
---	= WHITE PAINT LINE
---	= PURPLE PAINT LINE
---	= BLUE PAINT LINE
---	= YELLOW PAINT LINE

Symbol Legend:

NOT TO SCALE

ARV	AIR RELEASE VALVE	□	LIGHT POLE (QUAD)
○	BORING HOLE LOCATION	○	MAILBOX
○	BRICK PAVERS	○	MONITOR WELLS
○	CABLE TV RISER	●	NAIL & DISC (AS NOTED)
○	CENTRAL ANGLE	2	PARKING SPACES (2)
○	CLEAN OUT	○	POST INDICATOR VALVE
○	COMMUNICATION MANHOLE	○	PULL BOX (AS NOTED)
○	CONCRETE	○	REVISION NUMBER (3)
○	CONCRETE LIGHT POLE	○	RECLAIMED WATER MARKER
○	CONCRETE LIGHT POLE (DUAL)	○	RECLAIMED WATER METER
○	CONCRETE LIGHT POLE (TRIPLE)	○	RECLAIMED WATER RISER
○	CONCRETE LIGHT POLE (QUAD)	○	RECLAIMED WATER VALVE
○	CONCRETE MITERED END SECTION	○	ROOF DRAIN
○	CONCRETE PAVERS	○	SANITARY SEWER MANHOLE
○	CONCRETE RIP RAP	○	SANITARY SEWER MARKER
○	CONCRETE UTILITY POLE	○	SANITARY SEWER VALVE
○	COUNTY ROAD SYMBOL	○	INFORMATION SIGN
○	CROSSWALK SIGNAL POLE	○	SECTION CORNER
○	DETECTABLE WARNING AREA	○	4" X 4" CM LB #7143
○	DUAL SUPPORT SIGN	○	5/8" IR&C LB #7143
○	ELECTRIC MANHOLE	○	SIGN
○	ELECTRIC METER	○	SITE BENCH MARK
○	ELECTRIC JUNCTION BOX	○	STORM SEWER MANHOLE
○	ELECTRIC OUTLET	○	STRIPING (DIRECTIONAL)
○	ELECTRIC RISER	○	TELEPHONE CABLE RISER
○	FIBER OPTIC MARKER	○	TELEPHONE MANHOLE
○	FIRE DEPARTMENT CONNECTION	○	TELEPHONE LINE MARKER
○	FIRE HYDRANT	○	TELEPHONE JUNCTION BOX
○	FLOOD LIGHT	○	TEST HOLE
○	FOUND CONCRETE MONUMENT (AS NOTED)	○	TRAFFIC SIGNAL BOX
○	FOUND IRON PIPE (AS NOTED)	○	TRAFFIC SIGNAL SUPPORT POLE
○	FOUND IRON REBAR (AS NOTED)	○	UNKNOWN MANHOLE
○	FOUND/SET NAIL (AS NOTED)	○	UNKNOWN UTILITY MARKER
○	GARBAGE CAN	○	UNKNOWN RISER
○	GAS MARKER	○	UNKNOWN VALVE
○	GAS VALVE	○	UTILITY FLAG (AS NOTED)
○	GOPHER TORTOISE HOLE	○	VENT (AS NOTED)
○	GRATE INLET	○	WATER METER
○	GRAVEL/DIRT	○	WATER RISER
○	GREASE TRAP MANHOLE	○	WATER SERVICE
○	GROUND LIGHT	○	WATER SPIGOT
○	GUY ANCHOR	○	WATER SPRINKLER
○	HANDICAP PARKING SPACE	○	WATER VALVE
○	INTERSTATE SYMBOL	○	WELL
○	RED PAINT LINE	○	WETLAND FLAG
○	WHITE PAINT LINE	○	WOOD UTILITY POLE
○	PURPLE PAINT LINE	○	WATER LINE MARKER
○	BLUE PAINT LINE	○	WIRE HEIGHTS (SEE CHART)
○	YELLOW PAINT LINE	○	

Sign Legend:

NOT TO SCALE

(R1)	ROW NUMBER SIGN
(B)	BUS STOP SIGN
(DE)	DEAD END SIGN
(DNE)	DO NOT ENTER SIGN (R5-1)
(HC)	HANDICAP SIGN
(HO)	DUAL HANDICAP SIGN
(FDC)	FIRE DEPARTMENT CONNECTION
(INFO)	INFORMATION SIGN
(KR)	KEEP RIGHT SIGN
(LTO)	LEFT TURN ONLY
(ME)	MEDIAN SIGN
(MO)	MOBILE ORDER PARKING SIGN
(ND)	NO DUMPING SIGN
(NL)	NO LEFT TURN SIGN (R3-2)
(NLI)	NO LITTERING SIGN
(NO)	NO OUTLET SIGN
(FL)	NO PARKING FIRE LANE SIGN
(NOR)	NO RIGHT TURN SIGN (R3-1)
(NTT)	NO THRU TRAFFIC SIGN
(NOT)	NO TRUCKS (R5-2)
(NP)	NO PARKING SIGN
(1W)	ONE WAY SIGN (R6-2)
(PE)	PEDESTRIAN CROSSING SIGN
(PU)	PICKUP PARKING SIGN
(RP)	RESERVED PARKING SIGN
(RTO)	RIGHT TURN ONLY
(SL)	SPEED LIMIT SIGN
(ST)	STOP SIGN (R1-1)
(SS)	STREET SIGN
(TZ)	TOW AWAY ZONE SIGN
(TE)	TRUCK ENTRANCE SIGN
(TX)	TRUCK EXIT SIGN
(U)	UNKNOWN SIGN
(WL)	WEIGHT LIMIT SIGN
(WW)	WRONG WAY SIGN
(Y)	YIELD SIGN

Index of Survey Sheets

1	COVER SHEET
2	TOPOGRAPHIC SURVEY

Surveyor's Certification:

I hereby certify that the attached "Topographic Survey" of the hereon-described property is true and correct to the best of my knowledge, information and belief as surveyed in the field on June 17, 2022. I further certify that this "Topographic Survey" meets the standards of practice set forth in Rule Chapter 5J-17 of the Florida Administrative Code, pursuant to FS 472.027.

THE ELECTRONIC SIGNATURE HEREON IS IN COMPLIANCE WITH THE FLORIDA ADMINISTRATIVE CODE (FAC) 5J-17.06(2)(5) AND THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY THOMAS J. GALLOWAY, PSM, 6549 ON 10/21/2022 PER 5J-17.06(2)(2)

For the Firm By: Thomas J. Galloway
Professional Surveyor and Mapper
Florida Registration No. 6549

TOPOGRAPHIC SURVEY

CITY OF OCOEE
1820 A D MIMMS ROAD
SECTION 9-TOWNSHIP 22 SOUTH-RANGE 28 EAST
ORANGE COUNTY, FLORIDA

THIS SURVEY IS NOT VALID WITHOUT SURVEY SHEETS 1 THROUGH 2 OF 2.

Sheet No.
V0.1

A	B	C	D	E	F	G	H	I	J	K	L	M
---	---	---	---	---	---	---	---	---	---	---	---	---

10/30/2023 2:44:48 PM

Autodesk Docs://06023 Ocoee WWTP Electrical Building/06023 Ocoee WWTP-A-22.rvt

A	
B	
C	
D	
E	

Autodesk Docs://O6023 Ocoee WWTP Electrical Building/O6023 Ocoee WWTP-A-22.rvt

F

G

H

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NOTE: THE SCALE OF THESE PLANS MAY



A500 DOOR SCHEDULE													
MARK	HEIGHT	DOOR FRAME			DOOR PANEL		RATING	GLAZING	DETAILS			Door Hardware	COMMENTS
		WIDTH	TYPE	MATERIAL	TYPE	MATERIAL			HEAD	JAMB	SILL		
100A	7' - 0"	3' - 0"	3	HM	F	HM	0 MIN	N/A	G12/A521	C12/A521	A12/A521	1	
100B	8' - 8"	6' - 0"	4	HM	F (2)	HM	0 MIN	N/A	G12/A521	C12/A521	A12/A521	2	

FLOOR PLAN GENERAL NOTES

- 1 REFER TO G101 FOR LIFE SAFETY INFORMATION, INCLUDING WALL RATINGS.
2 REFER TO DIMENSION PLANS FOR WALL TYPES.
- DIMENSIONED PLAN GENERAL NOTES**
- 1 EACH CONTRACTOR SHALL VERIFY ALL DIMENSIONS SHOWN ON THE DRAWINGS AND OBTAIN ALL
MEASUREMENTS REQUIRED FOR PROPER EXECUTION OF WORK. WHEN VERIFICATION OF EXISTING DIMENSIONS
IS REQUIRED, THE CONTRACTOR REQUIRING SAID VERIFICATION FOR THE CONSTRUCTION OR FABRICATION OF
THIS MATERIAL SHALL BE THE CONTRACTOR RESPONSIBLE FOR THE PROCUREMENT OF THE FIELD INFORMATION.
2 REFER TO ENLIGHT PLANS / DETAILS FOR ADDITIONAL DIMENSIONS NOT SHOWN ON THESE PLANS.
3 REFER TO SHEET A-001 FOR DRAWING CONVENTIONS AND SYMBOLS.

GENERAL NOTES - PARTITIONS

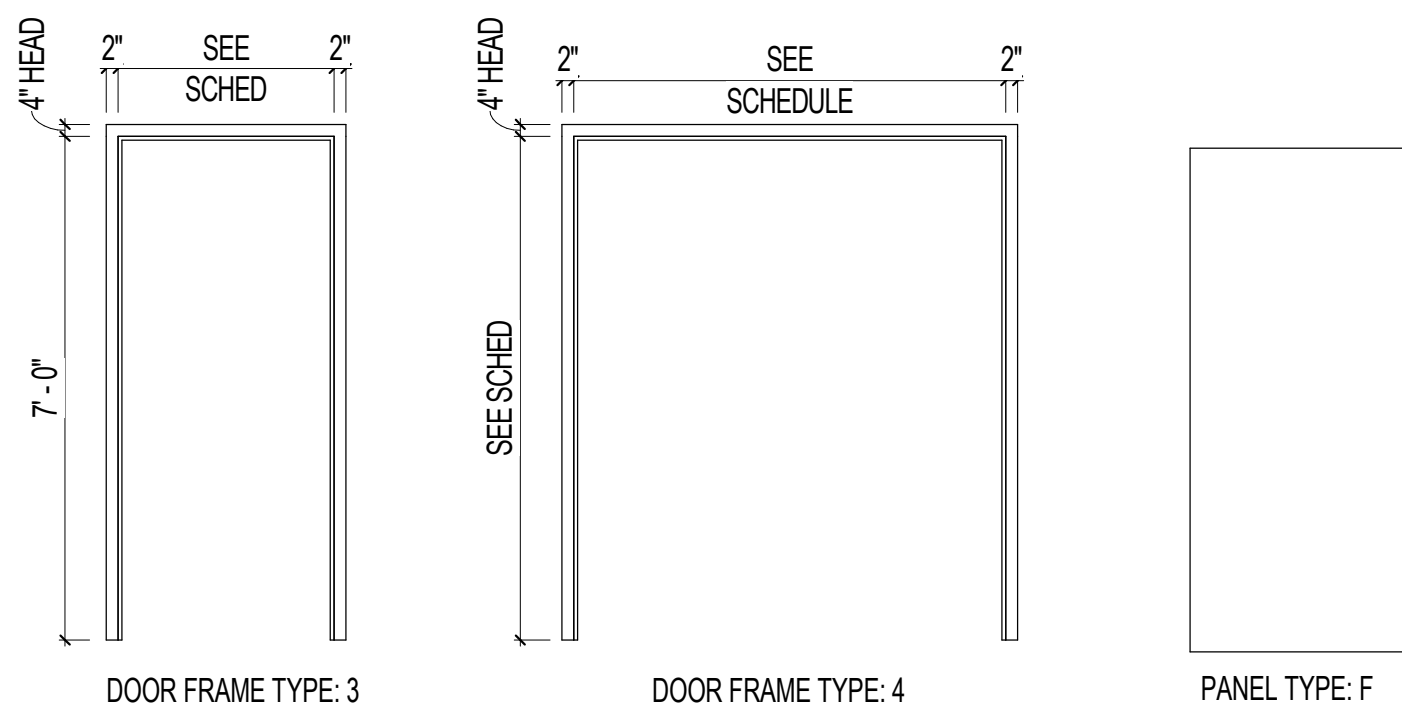
- 1 PARTITIONS ARE DISTINGUISHED ON FLOOR PLANS BY GRAPHIC AND TWO-PART SYMBOL DESIGNATIONS. THE ALPHABETIC SYMBOL INDICATES THE PARTITION TYPE AND THE NUMERIC CHARACTER DESIGNATES THE STUD, CMU OR CONCRETE WUD. REFER TO THE PARTITION TYPE DIAGRAMS.
- 2 FLR, CLNG AND STRUCT DELINEATED IN THE PARTITION TYPE SECTIONS ARE DIAGRAMMATIC AND DO NOT REFLECT EXACT CONSTRUCTION CONDITIONS OR GEOMETRY.
- 3 SEALANT: REFER TO THE SEALANT SCHEDULE FOR SEALANT TYPES AT ALL PARTITIONS. ALL PARTITIONS SHALL HAVE SCHEDULED SEALANT AT THE HEAD, SILL, THRU-PENETRATIONS, OPENINGS AND JUNCTURES WITH DISSIMILAR MATERIALS.
- 4 IF NO SYMBOL DESIGNATION IS PROVIDED, MASONRY WALLS SHALL BE TYPE F8
- 5 REFER TO STRUCTURAL DRAWINGS FOR REINFORCING INFORMATION

DOOR & HARDWARE GENERAL NOTES

- 1 DOOR NUMBERING MUST BE FOLLOWED EXACTLY PER PLANS. ANY CONFLICTS SHOULD BE BROUGHT TO ARCHITECTS OR TENANT CIMS ATTENTION.
- 2 G.C. TO VERIFY ALL HARDWARE FUNCTION, KEYING AND SECURITY REQUIREMENTS WITH OWNER PRIOR TO PURCHASE. COORDINATE KEYING WITH OWNER.
- 3 VERIFY ROUGH OPENING SIZES AND REQUIREMENTS WITH DOOR/FRAME MANUFACTURER.
- 4 MAXIMUM FULL FORCES FOR EXTERIOR DOORS TO BE 15 LBS.
- 5 PROVIDE RUST INHIBITOR COATING AND STAINLESS STEEL SCREWS/FASTENERS ON ALL HARDWARE ITEMS AT EXTERIOR DOORS PER MANUFACTURER SPECIFICATIONS.
- 6 ALL HARDWARE SHALL BE COORDINATED WITH ELECTRICAL AND SECURITY CONTRACTORS.
- 7 ALL HM DOORS TO BE 1 3/4" THICK. EXTERIOR HM DOORS TO BE INSULATED WITH A U-VALUE OF 0.50.
- 8 ALL DOOR HARDWARE SHALL BE FULLY ACCESSIBLE PER THE PROVISIONS OF IBC 1010.1.0 AND ANSI A117.1 SECTION 4.01.
- 9 ALL DOORS TO BE READILY OPERABLE IN THE DIRECTION OF EGRESS TRAVEL WITHOUT THE USE OF A KEY OR SPECIAL EFFORT.
- 10 DOORS OPENING INTO SEMI-HEATED SPACE, UNCONDITIONED SPACE, OR TO THE EXTERIOR SHALL COMPLY WITH LOCAL ENERGY CODES.
- 11 GC TO COORDINATE WITH OWNER SUPPLIED AND INSTALLED SECURITY AND ALARM SYSTEM

TERMITE PROTECTION - FLORIDA

- A PERMANENT SIGN WHICH IDENTIFIES THE TERMITE TREATMENT PROVIDER AND NEEDS FOR RE-SELECTION AND TREATMENT CONTRACT RENEWAL SHALL BE PROVIDED. THE SIGN SHALL BE POSTED NEAR THE ELECTRIC PANEL. FBC 160.10
202. DISCOUNTS SHALL DISCHARGE AT LEAST 1'-0" AWAY FROM BUILDING SIDE WALLS. FBC 150.3
203. PROVIDE FOR INSPECTION FOR TERMITE INFESTATION, BETWEEN WALL COVERING AND FINAL EARTH GRADE SHALL NOT BE LESS THAN 6". EXCEPTIONS: PAINT OR DECORATIVE CELEMENT FINISH LESS THAN 5/8" IN THICK ADHERED DIRECTLY TO THE FOUNDATION WALL. ACCESS OR VEHICLE RAMP WHICH RISE TO THE INTERIOR FINISH FLOOR ELEVATION FOR THE WIDTH OF SUCH RAMP ONLY. IF THE PATIO HAS BEEN SEAL TREATED FOR TERMITES, THE FINISH ELEVATION MAY MATCH THE BUILDING INTERIOR FINISH FLOOR ELEVATIONS ON MASONRY OR CONCRETE. FBC 160.11
204. INITIAL TREATMENT SHALL BE DONE AFTER ALL EXCAVATION AND BACKFILL IS COMPLETE. FBC 1616.1
205. SOIL DISTRIBUTED AFTER THE INITIAL TREATMENT SHALL BE RETREATED INCLUDING SPACES BOXED OR FORMED FBC 1616.12
206. SPACE IN CONCRETE FLOORS BOXED OUT OR FORMED FOR THE SUBSEQUENT INSTALLATION OF ANY PURPOSE SHALL BE CREATED BY USING PLASTIC OR METAL PERMANENTLY PLACED FORMS OF SUFFICIENT DEPTH TO ELIMINATE ANY PLANNED SOIL DISTURBANCE AFTER INITIAL CHEMICAL SOIL TREATMENT. FBC 1616.13
207. MINIMUM 5 MIL VAPOR RETARDER MUST BE INSTALLED TO PROTECT AGAINST RAINFALL DILUTION. IF RAINFALL OR WATER VAPOR RETARDER IS NOT INSTALLED, A TREATMENT SYSTEM IS REQUIRED. FBC 1616.14
208. CONCRETE OVERLAP OR MORTAR ACCUMULATED ALONG THE EXTERIOR FOUNDATION PERIMETER SHALL BE REMOVED PRIOR TO EXTERIOR CHEMICAL SOIL TREATMENT, TO ENHANCE VERTICAL PENETRATION OF THE CHEMICALS. FBC 1616.15
209. SOIL TREATMENT MUST BE APPLIED UNDER ALL EXTERIOR CONCRETE OR GRADE WITHIN 1'-0" OF THE STRUCTURE SIDEWALLS. FBC 1616.16
210. AN EXTERIOR VERTICAL CHEMICAL BARRIER MUST BE INSTALLED AFTER CONSTRUCTION IS COMPLETE INCLUDING CONCRETE FOUNDATION AND RETENTION. ANY SOIL DISTURBED AFTER THE VERTICAL BARRIER IS APPLIED SHALL BE RETREATED. FBC 1616.18
211. IF A REGISTERED TERMITICIDE FORMULATED AND REGISTERED AS A BAIT SYSTEM IS USED FOR SUBTERRANEAN TERMITE PREVENTION, SECTIONS 1616.1.1 THROUGH 1616.1.6 DO NOT APPLY; HOWEVER, A SIGNED CONTRACT ASSURING THE INSTALLATION, MAINTENANCE, AND MONITORING OF THE BAITING SYSTEM THAT IS IN COMPLIANCE WITH THE REQUIREMENTS OF CHAPTER 482, FLORIDA STATUTES SHALL BE PROVIDED TO THE BUILDING OFFICIAL. IF THE MONITORING IS PERFORMED BY THE SLAB, AND THE SYSTEM MUST BE INSTALLED PRIOR TO FINAL BUILDING APPROVAL. IF THE BAITING SYSTEM DIRECTIONS FOR USE REQUIRE A MONITORING PHASE PRIOR TO INSTALLATION OF THE PESTICIDE ACTIVE INGREDIENT, THE INSTALLATION OF THE MONITORING PHASE COMPONENTS SHALL BE DEEMED TO CONSTITUTE INSTALLATION OF THE SYSTEM. FBC 1616.17
212. IF A REGISTERED TERMITICIDE FORMULATED AND REGISTERED AS A WOOD TREATMENT IS USED FOR SUBTERRANEAN TERMITE PREVENTION, SECTIONS 1616.1.1 THROUGH 1616.1.6 DO NOT APPLY. APPLICATION ON A FRAME PRIOR TO FINAL BUILDING APPROVAL SHALL BE AS REQUIRED BY LABEL DIRECTIONS FOR USE, AND MUST BE COMPLETED PRIOR TO FINAL BUILDING APPROVAL. CHANGES IN FRAMING OR ADDITIONS TO FRAMING IN AREA OF THE STRUCTURE REQUIRING TREATMENT THAT OCCUR AFTER THE INITIAL WOOD TREATMENT MUST BE TREATED PRIOR TO FINAL BUILDING APPROVAL. FBC 1616.18
213. AFTER ALL WORK IS COMPLETED, LOOSE WOOD AND FILL MUST BE REMOVED FROM BELOW AND WITHIN 1'-0" OF THE BUILDING THIS INCLUDES ALL GRADE STAKES, TUB TRAP BOXES, FORMS SHORING OR OTHER CELLULOSE OR ORGANIC MATERIAL. FBC 160.12
214. NO WOOD, VEGETATION, STUMPS, CARDBOARD, STRATH, ETC. SHALL BE BURIED WITHIN 15'-0" OF ANY BUILDING OR PROPOSED BUILDING. FBC 220.1.28.1



DOOR FRAME TYPES

DOOR PANEL TYPES

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Drawn:	FGH
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FLOOR PLAN-OPERATION BUILDING

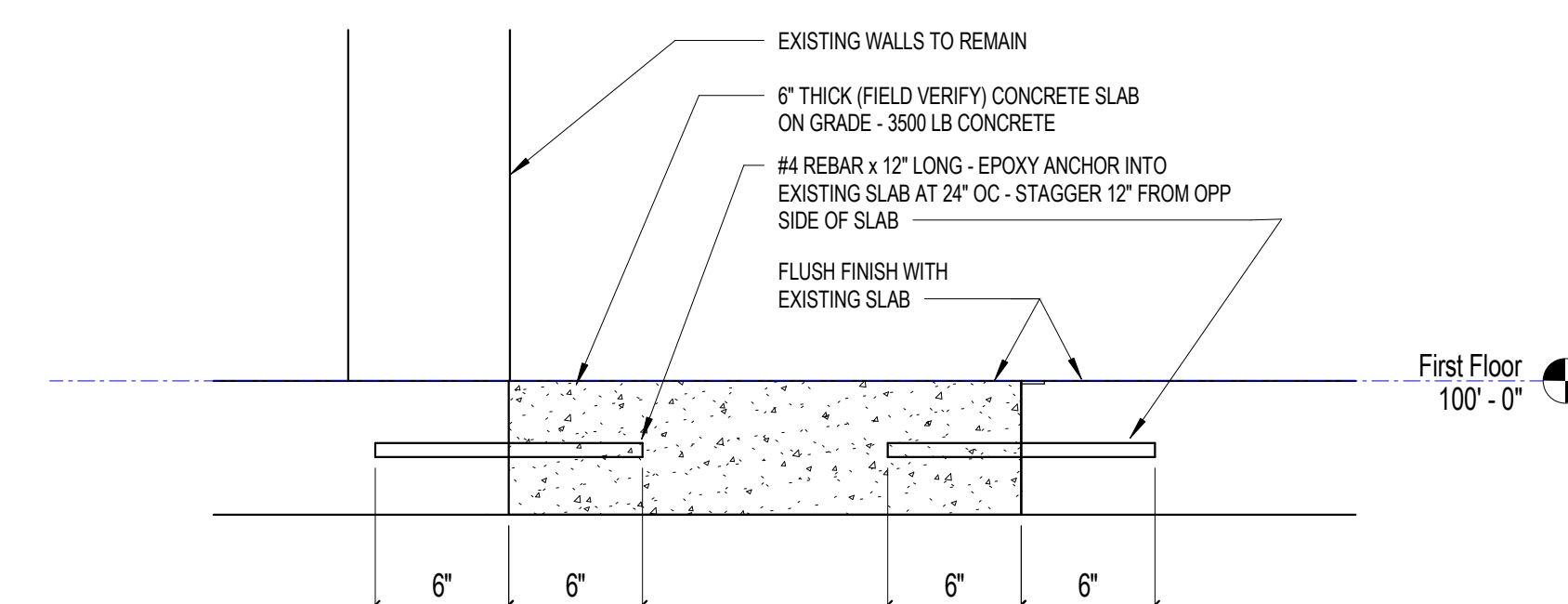
COOEE WWTP - ELECTRIC UPGRADE AND EXPANSION

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OCOOEE, FL, 34761

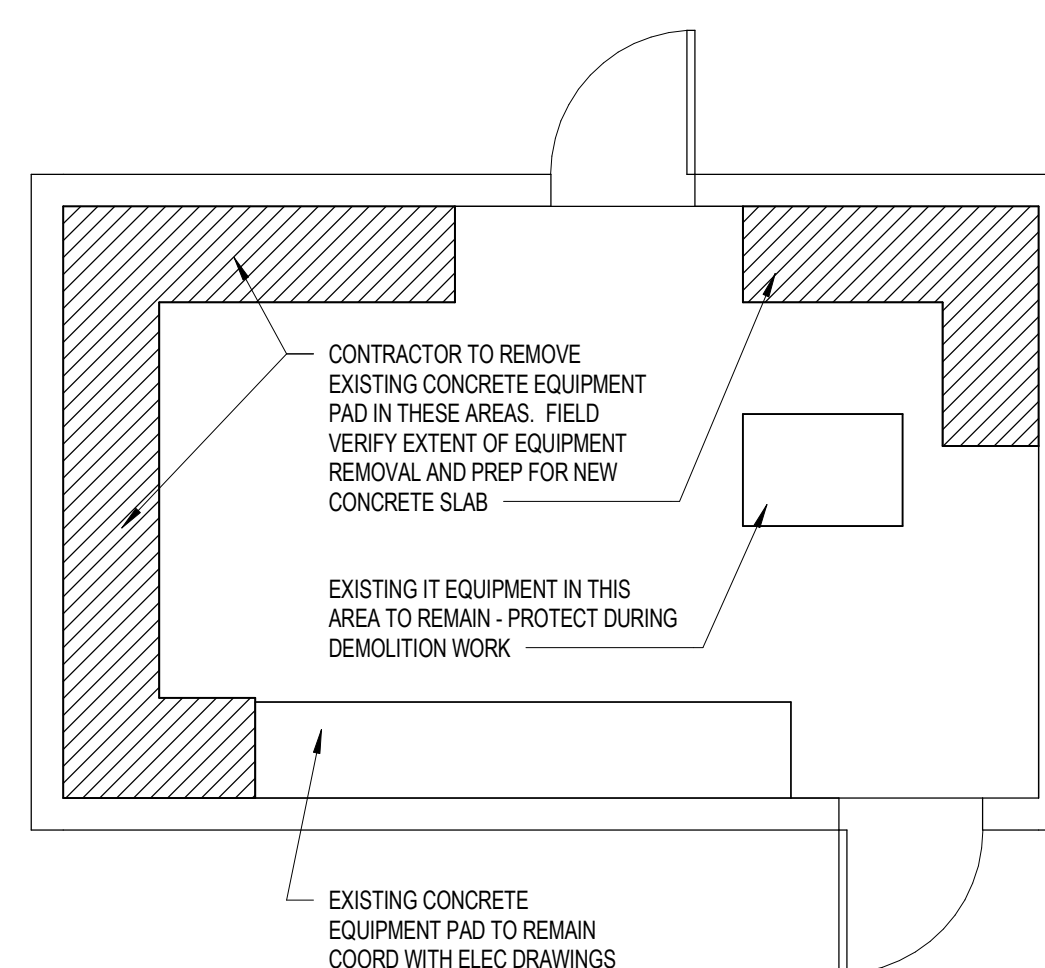
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Sheet No.

A102



G11
 1 1/2" = 1'-0"
 OPERATION BUILDING - NEW
 SLAB DETAIL

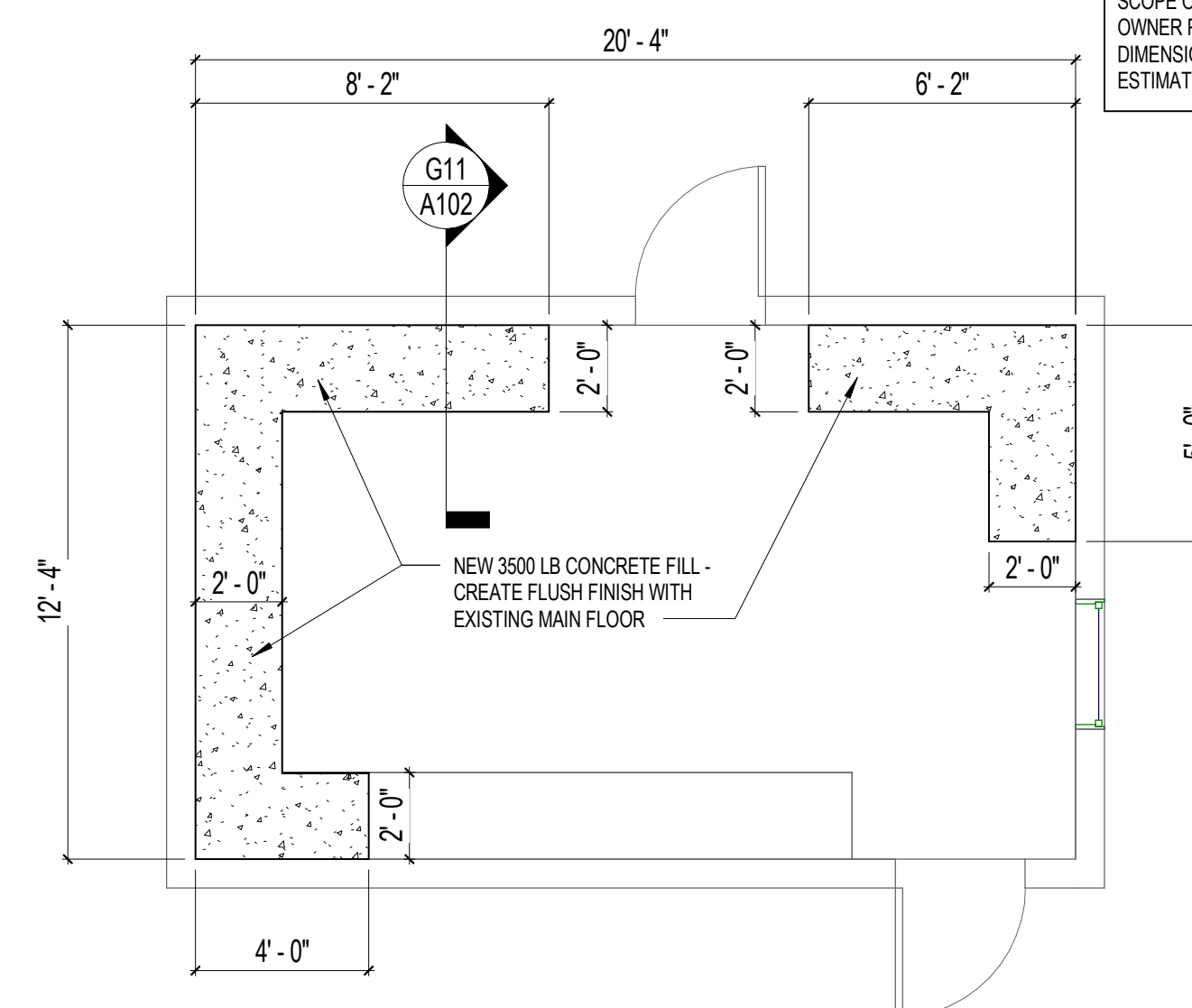


A6

OPERATION BUILDING -
DEMOLITION PLAN

1/4" = 1'-0"

4ft. 0 4ft. 8ft.

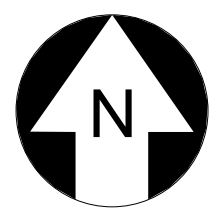


A11

OPERATION BUILDING - NEW CONSTRUCTION

1/4" = 1'-0"





1/4" = 1'-0"

A horizontal graphic scale bar with alternating black and white segments. It is marked with "0" at the center, "4ft." at the left end, and "8ft." at the right end.

1 NO CONDUIT ON ROOF
2 ALL COMPONENTS FOR THE ROOF DRAINAGE SYSTEM SHALL BE SIZED BASED ON A STORM OF 60 MINUTES
DURATION AND 100 YEAR RETURN PERIOD PER LOCAL BUILDING CODE
3 ALL ROOF MATERIALS SHALL COMPLY W/ THE STANDARDS AS SPECIFIED BY LOCAL CODE AND SHALL HAVE A
FIRE CLASSIFICATION AS REQUIRED

GENERAL NOTES:

1. PROVIDE MANUF. STANDARD DETAILS FOR ROOF PENETRATIONS
2. SEE MECHANICAL PLANS FOR EXTENT OF HVAC EQUIPMENT
3. SEE ELECTRICAL PLANS FOR ELEC EQUIPMENT.
4. PROVIDE CONCRETE SPLASH BLOCKS AT EACH DOWNSPOUTS WHERE IT DISCHARGES ONTO GROUND BELOW.
5. COORDINATE WALL MTD. ITEMS WITH EXTERIOR ELEVATIONS.
6. REFER TO SHEET A521 FOR ROOF DETAILS. REFER TO WALL SECTIONS & DETAILS FOR ADDITIONAL ROOF DETAILING.
7. REFER TO SPECIFICATIONS FOR ALUMINUM AWNINGS INFORMATION

State of Florida Licenses:
Architect No. AA2600926
Engineer No. 3215
Landscape No. LC0000298
Surveyor No. 7143



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Drawn:	Author
Checked:	Checker
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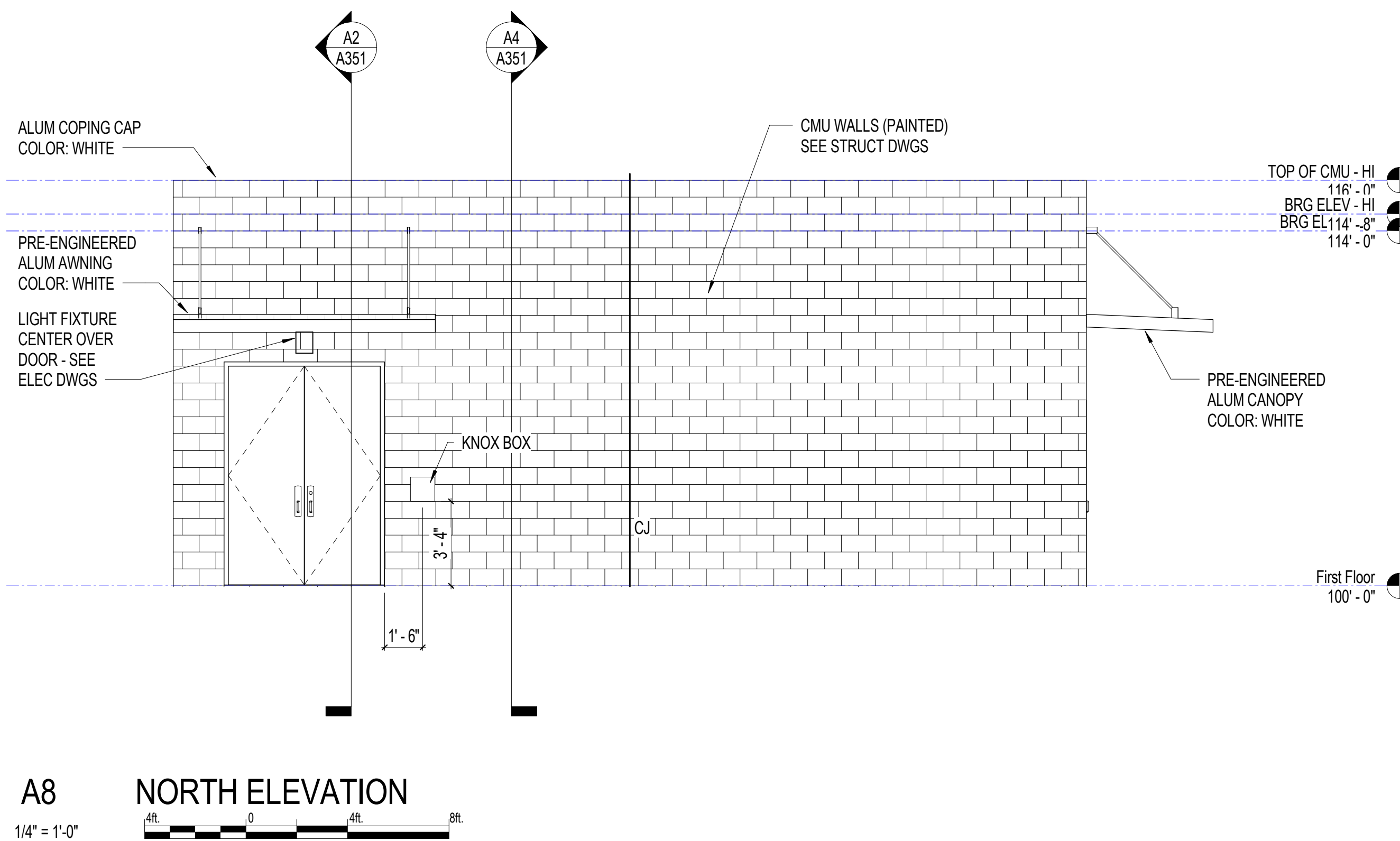
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Sheet No.

A201





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WALL SECTIONS

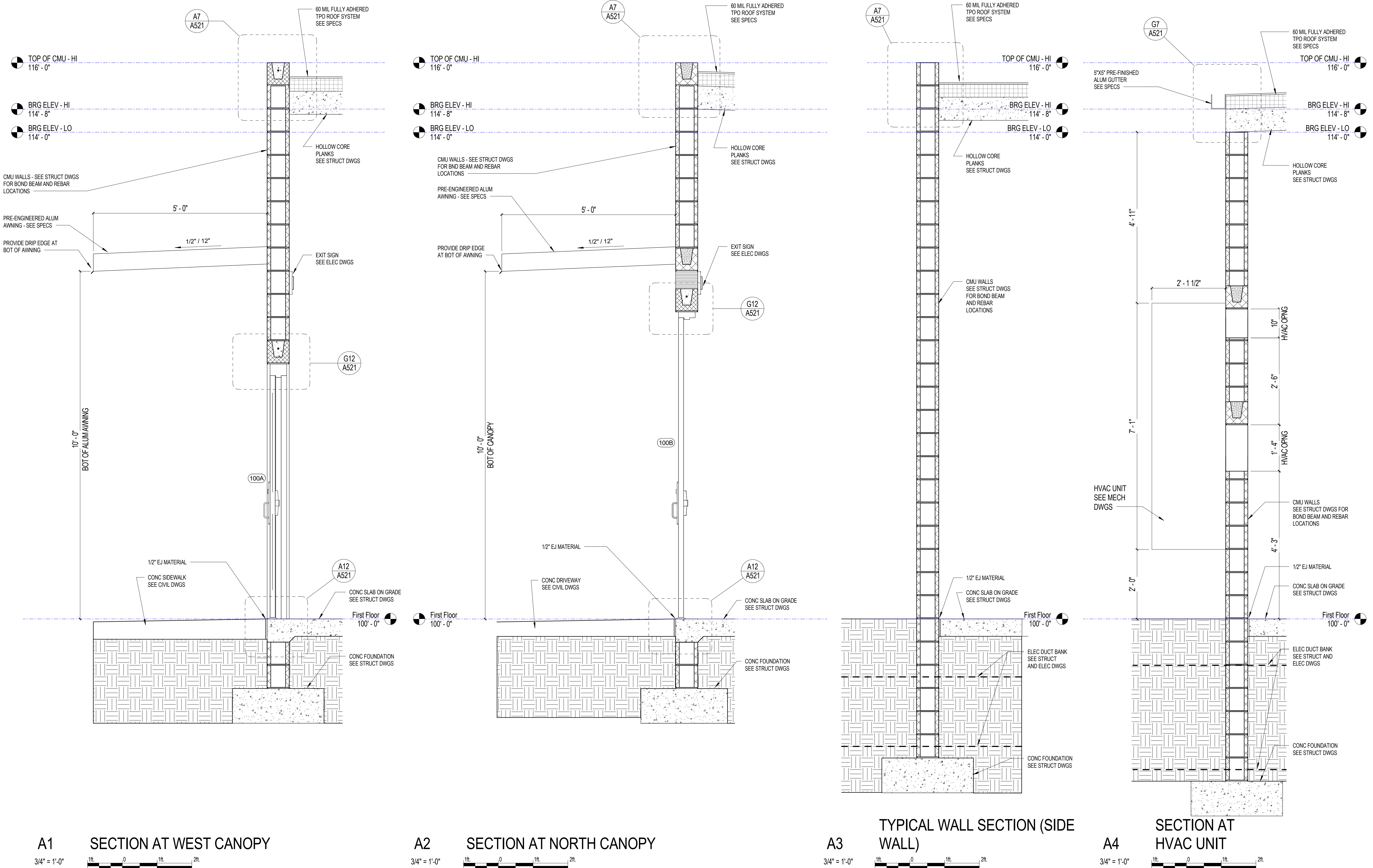
OCCEE WWTP - ELECTRIC UPGRADE AND EXPANSION

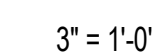
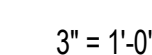
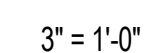
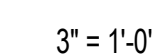
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Sheet No.

A351





Sheet No.
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GENERAL NOTES

THE FOLLOWING NOTES SHALL APPLY TO ALL STRUCTURAL DRAWINGS.

THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS WITH THE ARCHITECTURAL DRAWINGS. ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE INTENDED TO AUGMENT, NOT SUPERSEDE, THOSE SHOWN ON THE ARCHITECTURAL DRAWINGS. DO NOT SCALE DRAWINGS. DRAWINGS MAY NOT BE TO SCALE.

THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS AND NOTIFY THE ARCHITECT PRIOR TO FABRICATION AND CONSTRUCTION. FOR DIMENSIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS, SEE THE ARCHITECTURAL DRAWINGS.

IF MATERIAL QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR QUANTITY, STRENGTH OR NOTED SHALL BE PROVIDED.

THE STRUCTURAL MODIFICATIONS ARE DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER CONSTRUCTION IS FULLY COMPLETED. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING CONSTRUCTION, INCLUDING PROVISIONS FOR CHANGEABLE WEATHER UNTIL THE BUILDING IS CLOSED AND CONDITIONED. THE CONTRACTOR SHOULD DESIGN, INSTALL AND SUBSEQUENTLY REMOVE ANY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS NECESSARY TO MAINTAIN SAFETY AND STRUCTURAL STABILITY DURING CONSTRUCTION.

IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY PROCEDURES, WHILE FOLLOWING ALL APPLICABLE SAFETY CODES, BUILDING CODES AND GOVERNING REGULATIONS WITH JURISDICTION OVER THE CONSTRUCTION SITE DURING ALL PHASES OF CONSTRUCTION. THE STRUCTURAL ENGINEER OF RECORD IS NOT RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION OR FOR RELATED SAFETY PROCEDURES.

ANY FRAMING SHOWN ON DRAWINGS THAT SUPPORT EQUIPMENT (WHETHER SUPPORTED ABOVE OR SUSPENDED BELOW), DESIGN LOADS, OPENINGS AND PENETRATIONS, AND STRUCTURAL MEMBERS IN ANY MANNER RELATED TO HVAC, PLUMBING, ELECTRICITY OR FIRE PROTECTION REQUIREMENTS IS BASED ON EQUIPMENT DESIGNED, SHOWN AND/OR SPECIFIED IN THE CONSTRUCTION DOCUMENTS.

ALL REQUIREMENTS FRAMING MAY NOT BE SHOWN. USING THE DETAILS PROVIDED ON THE STRUCTURAL DRAWINGS, THE GENERAL CONTRACTOR AND SUB-CONTRACTOR AND/OR EACH PRIME CONTRACTOR MUST COORDINATE AND INSTALL THE ACTUAL FRAMING REQUIRED FOR THE EQUIPMENT TO BE INSTALLED, AND INCLUDE COST FOR ALL REQUIRED FRAMING IN THE BID.

EXISTING BUILDING: INSTALL TEMPORARY SUPPORT AND OTHER MEASURES AS REQUIRED TO PREVENT DAMAGE TO THE EXISTING BUILDING DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION AND FINAL CLEARANCE OF REQUIRED NEEDLING, SHORING, UNDERPINNING OR BRACING OF THE EXISTING BUILDING. FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS AND CONDITIONS WHICH AFFECT THE NEW CONSTRUCTION PRIOR TO THE START OF WORK. EXISTING CONDITIONS SHOWN ON THE DRAWINGS ARE ASSUMED. HAVE NOT BEEN CONFIRMED. ARE NOT GUARANTEED AND MAY CONFLICT WITH THE NEW WORK REQUIRED. FIELD VERIFY THAT THE EXISTING FRAMING AFFECTED BY THE NEW WORK IS IN SOUND CONDITION AND DOES NOT DISPLAY VISIBLE SIGNS OF DISTRESS OR DETERIORATION OR HAS BEEN PREVIOUSLY MODIFIED OR ALTERED. IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BETWEEN THE INFORMATION SHOWN ON THE DRAWINGS AND ACTUAL FIELD CONDITIONS. DO NOT PROCEED WITH THAT PORTION OF WORK UNTIL ALL DISCREPANCIES HAVE BEEN RESOLVED. THE CONTRACTOR SHOULD SUBMIT A FIELD SURVEY SHOWING ALL DISCREPANCIES BETWEEN THE EXISTING CONDITION AND THE NEW WORK, BASED ON THE REPORTED FIELD CONDITIONS. THE ARCHITECT WILL SUBMIT SUPPLEMENTAL INSTRUCTIONS FOR ALL WORK (NEW OR EXISTING) REQUIRING MODIFICATIONS.

THE STRUCTURAL DRAWINGS ARE ONE DISCIPLINE OF THE CONTRACT DOCUMENTS AND DO NOT BY THEMSELVES CONTAIN ALL THE INFORMATION REQUIRED TO PROPERLY COMPLETE THE PROJECT STRUCTURE. THE GENERAL CONTRACTOR SHALL REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS AND COORDINATE THE INFORMATION INDICATED IN THESE CONSTRUCTION DOCUMENTS WITH THE STRUCTURAL DRAWINGS TO PROPERLY CONSTRUCT THE PROJECT.

ALL DETAILS, SECTIONS AND NOTES INDICATED ON THE CONSTRUCTION DOCUMENTS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS ELSEWHERE UNLESS OTHERWISE SHOWN.

SHOULD ANY OF DETAILED INSTRUCTIONS SHOWN ON THE PLANS CONFLICT WITH THESE STRUCTURAL NOTES, THE SPECIFICATIONS, OR WITH EACH OTHER, THE STRICTEST PROVISION SHALL GOVERN.

SPECIAL INSPECTIONS: NO SPECIAL INSPECTIONS ARE REQUIRED FOR STRUCTURAL ITEMS. REFER TO OTHER DISCIPLINES FOR SPECIAL INSPECTIONS OF NON-STRUCTURAL SYSTEMS WHERE REQUIRED.

SHOP DRAWINGS

A. SUBMIT THE FOLLOWINGS DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION:

1. HOLLOW CORE PLANKS

2. CONCRETE MIX DESIGNS

3. CONCRETE REINFORCEMENT

4. STRUCTURAL MASONRY

B. THE CONTRACTOR SHALL REVIEW AND ACCEPT FULL RESPONSIBILITY FOR DIMENSIONAL CORRECTNESS. ALL SHOP DRAWINGS MUST BEAR THE APPROVAL STAMP OF THE CONTRACTOR (TO INCLUDE INITIALS, DATE AND DISPOSITION). PRIOR TO REVIEW BY THE ARCHITECT OR ENGINEER, THE ENGINEER WILL RETURN ALL DRAWINGS, UNREVIEWED, THAT DO NOT BEAR THE APPROVAL STAMP OF THE CONTRACTOR.

CHANGES AND MODIFICATIONS:

SUBMIT WRITTEN REQUEST TO THE ARCHITECT FOR APPROVAL OF ANY PROPOSED CHANGE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

SPLICING, CUTTING, NOTCHING AND OTHER ALTERATIONS TO STRUCTURAL MEMBERS IS PROHIBITED WITHOUT WRITTEN AUTHORIZATION OF THE STRUCTURAL ENGINEER.

ANY UNAUTHORIZED DEVIATION FROM THE CONTRACT DOCUMENTS, AND CORRECTION THEREOF, IS THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR SHALL BRACE ALL CONSTRUCTION AGAINST GRAVITY, LATERAL & UPLIFT LOADS UNTIL STRUCTURE IS COMPLETE.

MASONRY

CONCRETE BLOCK DESIGN AND CONSTRUCTION SHALL CONFORM TO "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES" (TMS 402/ACI 530/ASCE 5) AND "SPECIFICATIONS FOR MASONRY STRUCTURES" (TMS 602/ACI 530.1/ASCE 6)

MASONRY MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING SPECIFICATIONS:

A. HOLLOW LOAD BEARING CONCRETE BLOCK: ASTM C-90, GR. N1. MINIMUM COMPRESSIVE STRENGTH = 1900 PSI AT 28 DAYS

B. MORTAR: ASTM C-270, TYPE S. MINIMUM COMPRESSIVE STRENGTH = 1800 PSI AT 28 DAYS

C. MORTAR: ASTM C-270, TYPE M. MINIMUM COMPRESSIVE STRENGTH = 2500 PSI AT 28 DAYS

D. GROUT: ASTM C-476. MINIMUM COMPRESSIVE STRENGTH = 2000 PSI AT 28 DAYS

E. MASONRY REINFORCEMENT: ASTM A-82 GALVANIZED

F. MASONRY PRISM STRENGTH: F_m = 1500 PSI

TYPICAL REINFORCING:

VERTICAL - REF. PLAN FOR SIZE AND SPACING

HORIZONTAL - #9 WIRE IN DUR-O-WALL (LADDER TRUSS TYPE) OR APPROVED EQUAL AT 16" O.C. IN MASONRY WALLS, EXCEPT AT

8" O.C. FOR

WALL BELOW GRADE OR STACK BOND WALLS (U.N.O. ON DRAWINGS)

PRIOR TO DELIVERY OF MASONRY UNITS TO THE JOB SITE, FURNISH TO THE OWNER AFFIDAVITS FROM AN APPROVED TESTING LABORATORY CERTIFYING THAT ALL UNITS CONFORM TO THEIR RESPECTIVE ASTM REQUIREMENTS.

PROVIDE CLEANOUT AT THE BASE OF ALL GROUTED MASONRY CELLS. CLEAN MASONRY VOID TO BE GROUTED OF ALL DEBRIS AND MORTAR PROTRUSIONS.

GROUT ALL CAVITIES CONTAINING REINFORCEMENT IN LIFTS NOT TO EXCEED 5'-0" (REFER TO DETAILS).

LABORATORY PREPARED MIXES SHALL BE PREPARED AND TESTED IN ACCORDANCE WITH ASTM C-770. FIELD MORTAR SHALL BE TESTED WITH AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH ASTM C-780. TWO SETS OF THREE MORTAR CUBES SHALL BE TAKEN DIRECTLY FROM THE MIXER FOR EACH DAY OF MASONRY WORK. TEST THE CUBES AT 28 DAYS. ACCEPTANCE OF THE MORTAR SHALL BE AT THE DISCRETION OF THE ENGINEER.

CALCIUM CHLORIDE AND/OR ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE INCLUDED IN MORTAR OR GROUT MIX, EXCEPT WHEN APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. NO ANTI-FREEZE COMPOUNDS SHALL BE USED TO LOWER THE MORTAR'S FREEZING POINT.

NO EXTERIOR MASONRY SHALL BE LAID WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN 40 DEGREES FAHRENHEIT, UNLESS THE RECOMMENDATIONS SPECIFIED BY THE INTERNATIONAL MASONRY INDUSTRY ALL-WEATHER COUNCIL IN THEIR PUBLICATION "RECOMMENDED PRACTICES AND GUIDE SPECIFICATIONS FOR COLD WEATHER MASONRY" ARE STRICTLY FOLLOWED.

THE MASONRY CONTRACTOR SHALL PROVIDE BRACING TO WITHSTAND HORIZONTAL PRESSURES AS REQUIRED BY THE BUILDING CODE AND LOCAL ORDINANCE.

CONCRETE

ALL CONCRETE SHALL BE IN ACCORDANCE WITH THE "AMERICAN CONCRETE INSTITUTE BUILDING CODE" (ACI 318) AND WITH "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301) LATEST EDITIONS.

CONCRETE MEMBERS SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS:

A. STRUCTURAL CONCRETE CLASS LOCATION

I FOUNDATIONS

II INTERIOR SLABS ON GRADE AND ALL INTERIOR CONCRETE NOT OTHERWISE IDENTIFIED

III INTERIOR SLABS ON GRADE AND ALL INTERIOR CONCRETE NOT OTHERWISE IDENTIFIED

IV NOT USED

B. ALL DEFORMED REINFORCING BARS: ASTM A615, GR. 60

C. ALL WELDED WIRE FABRIC: ASTM A1064, DELIVERED IN FLAT SHEETS

ALL OTHER CONCRETE TO BE 4000 PSI UNLESS NOTED OTHERWISE

ALL CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST ADOPTED EDITIONS OF THE STANDARDS AND MATERIAL SPECIFICATIONS REFERENCED HEREIN.

CONCRETE MIX SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 301 CHAPTER 3, METHOD 1 OR METHOD 3. CONTRACTOR SHALL SUBMIT BACKUP DATA PER SECTION 28.4 OF ACI 318 LATEST EDITION.

ALL REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BULLET STEEL, CONFORMING TO ASTM A615 GR. 60. SUBMIT ALL REINFORCING STEEL SHOP DRAWINGS FOR APPROVAL PRIOR TO ANY FABRICATION.

CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS REQUIRED BY ACI SPECIFICATIONS.

WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. WELDED WIRE FABRIC SHALL BE LAPPED AT LEAST 12 INCHES UNLESS NOTED OTHERWISE.

REBAR LAP LENGTH SHALL BE 48 BAR DIAMETERS MINIMUM, UNLESS NOTED OTHERWISE ON DRAWINGS.

PROVIDE ACI STANDARD HOOKS UNLESS NOTED OTHERWISE ON DRAWINGS.

ALL CONCRETE WORK SHALL CONFORM TO ACI 318 LATEST EDITION "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE STRUCTURES". ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS," ACI 305 "HOT WEATHER CONCRETING," AND ACI 306 "COLD WEATHER CONCRETING."

ALL CONCRETE DETAILS SHALL CONFORM TO ACI 315 LATEST EDITION "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" UNLESS NOTED OTHERWISE ON THE DRAWINGS.

CONTRACTOR SHALL REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR LOCATIONS AND SIZES OF SLEEVES, OPENINGS, EMBEDDED ITEMS, SLAB RECESSES, SLOPES, ETC. THESE ITEMS SHALL BE COORDINATED WITH OTHER TRADES AND INSTALLED PRIOR TO CONCRETE PLACEMENT.

CONTRACTOR SHALL VERIFY ANCHOR BOLT SIZES AND LOCATIONS PRIOR TO CONCRETE PLACEMENT.

BAR LENGTHS PROVIDED ON DRAWINGS DO NOT INCLUDE HOOK LENGTH. HOOKS SHALL BE PROVIDED AT TOP BARS, AT BEAM ENDS, AND SLAB EDGES.

CONTRACTOR SHALL PROVIDE CHAIRS, BOLSTERS, SPACERS, ETC. AS REQUIRED TO SECURELY SUPPORT REINFORCEMENT. SUPPORT ITEMS ON EXPOSED CONCRETE SHALL BE PLASTIC SUPPORT REINFORCEMENT, TIPPED OR STAINLESS STEEL. IN HIGHLY CORROSIVE ENVIRONMENTS, SUPPORT ITEMS SHALL BE PLASTIC.

ONE COPY OF ALL CONCRETE TEST RESULTS SHALL BE SUBMITTED BY THE TESTING AGENCY DIRECTLY TO THE ENGINEER OF RECORD.

THE CONTRACTOR SHALL SEAL ALL HAIRLINE CRACKING IN CONCRETE SLAB ON GRADE WITH A CRACK SUPPRESSION KIT SUCH AS LATICRETE OR APPROVED EQUAL.

A COPY OF THE "FIELD REFERENCE MANUAL" ACI SP-15 LATEST EDITION SHALL BE KEPT BY THE CONTRACTOR ON SITE.

FIELD MANUAL: PROVIDE AT LEAST ONE COPY OF THE ACI FIELD REFERENCE MANUAL.

CONCRETE COVER: UNLESS OTHERWISE NOTED, DETAIL REINFORCING TO PROVIDE MINIMUM COVER AS FOLLOWS:

A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3 INCHES

B. CONCRETE EXPOSED TO EARTH OR WEATHER

#5 BARS AND SMALLER 1-1/2 INCHES

OTHERS 2 INCHES

C. CONCRETE NOT EXPOSED TO EARTH OR WEATHER

BEAM AND COLUMN BARS INCLUDING TIES, STIRRUPS AND SPIRALS 1-1/2 INCHES

SLABS, WALLS AND JOISTS: #11 BARS AND SMALLER 3/4 INCHES

OTHERS 1-1/2 INCHES

SLUMP, (AT POINT OF PLACEMENT): 5" (+/- 1")

CALCIUM CHLORIDE SHALL NOT BE USED IN ANY FORM.

EXPANSION BOLTING: UNLESS NOTED OTHERWISE ON PLANS OR IN SECTIONS, ALL EXPANSION BOLTS IN CONCRETE SHALL BE "HILTI KWIK BOLT 3 EXPANSION ANCHORS". ANCHORS USED IN EXTERIOR APPLICATIONS SHALL BE HOT-DIP GALVANIZED CARBON STEEL OR STAINLESS STEEL.

UNLESS NOTED OTHERWISE ON PLANS OR IN SECTIONS, ALL EPOXY ANCHORS FOR USE IN APPLICATIONS INVOLVING CONCRETE SHALL USE EITHER

A) HILTI HIT HY 200 ADHESIVE ANCHORING SYSTEM.

B) SIMPSON STRONG-TIE AT HIGH STRENGTH ACRYLIC-TIE ANCHORING ADHESIVE.

INSTALL ALL ANCHORS FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS

DESIGN CRITERIA

THE STRUCTURAL DESIGN OF THIS BUILDING WAS BASED ON THE DESIGN CRITERIA:

A. BUILDING CODE

FLORIDA BUILDING CODE 2020 7TH EDITION

B. DESIGN ROOF LOADS

DEAD LOADS 20 PSF

LIVE LOADS 20 PSF

C. DESIGN FLOOR LOADS

LIVE LOADS 100 PSF

D. ROOF SNOW LOAD DATA:

N/A

E. WIND DESIGN DATA:

ULTIMATE DESIGN WIND SPEED, V_{ult} 135 MPH

NOMINAL DESIGN WIND SPEED, V_{nom} 105 MPH

RISK CATEGORY: II

WIND EXPOSURE CATEGORY: C

INTERNAL PRESSURE COEFFICIENTS: +0.18

COMPONENTS AND CLADDING WIND PRESSURE: SEE WIND LOAD TABLES ON THIS SHEET.

WIND PRESSURES PER ASCE: 7-16

F. WIND-BORNE DEBRIS REGION (WITHIN HURRICANE-PRONE REGIONS)

1. WITHIN 1 MILE OF THE COASTAL MEAN HIGH WATER LINE WHERE V_{ult} IS 130 MPH OR GREATER; OR

2. IN AREAS WHERE V_{ult} IS 140 MPH OR GREATER.

G. EARTHQUAKE DESIGN DATA:

SEISMIC IMPORTANCE FACTOR, I_e 1.0

MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS, S_a= 0.062g S₁= 0.034g

SITE CLASS: D F_v= 2.4

SM_s= 1.6 SM₁= 0.081

DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS, S_{Ds}= 0.066 SD₁= 0.054

SEISMIC DESIGN CATEGORY: A

BASIC SEISMIC FORCE-RESISTING SYSTEM: ORDINARY REINFORCED MASONRY SHEAR WALLS

BASE SHEAR: N/A KIPS

SEISMIC RESPONSE COEFFICIENT, C_s 0.033

RESPONSE MODIFICATION COEFFICIENT, R 2

ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE

FOUNDATION

DESIGN SOIL BEARING PRESSURE IS 2,500 PSF PER THE GEOTECHNICAL REPORT.

A GEOTECHNICAL REPORT ON THE SUBSURFACE SOILS CONDITONS HAVE BEEN PREPARED FOR THIS PROJECT BY PROFESSIONAL SERVICE INDUSTRIES, INC., PROPOSAL NO. 0757-357521 & DATED JUNE 2, 2023.

ALL CONTRACTORS INVOLVED WITH THE EXCAVATION, BACKFILL AND FOUNDATION CONSTRUCTION SHALL FAMILIARIZE THEMSELVES WITH THIS REPORT.

ALL WORK REGARDING SITE PREPARATION, EARTH FILL CONSTRUCTION, BACKFILL REQUIREMENTS, FOUNDATION PREPARATIONS, ETC., SHALL BE IN STRICT CONFORMANCE TO THE GEOTECHNICAL ENGINEER'S REPORT. THE REPORT IS PART OF THE CONTRACT DOCUMENTS.

FOUNDATION BEARING SURFACES SHALL BE INSPECTED UNDER THE DIRECTION OF THE PROJECT GEOTECHNICAL ENGINEER.

IF NOT OTHERWISE SPECIFIED IN GEOTECHNICAL REPORT, COMPACT ALL FILL TO 98% OF OPTIMUM LABORATORY DENSITY IN ACCORDANCE WITH ASTM D696 STANDARD PROCTOR METHOD.

DO NOT BACKFILL AGAINST FOUNDATION OR BASEMENT WALLS UNTIL FLOOR SLAB/FRAMING IS IN PLACE OR PERMISSION IS OBTAINED FROM THE ARCHITECT.

EXCEPT FOR CANTILEVER RETAINING WALLS OR UNLESS NOTED OTHERWISE ON DRAWINGS, SUBGRADE WALLS ARE SUPPORTED BY THE FLOOR ABOVE AND BELOW. PROPER TEMPORARY BRACING MAY BE USED IN LEIU OF THE FLOOR SUPPORT BASED ON THE DESIGN BY A PROFESSIONAL ENGINEER.

ALL FOOTINGS ARE TO REST ON FIRM, LEVEL, UNDISTURBED SOIL OR ENGINEERED FILL, OF BEARING CAPACITY NOTED, REGARDLESS OF ELEVATIONS SHOWN ON DRAWINGS.

WHERE ROCK OR SHALE IS THE BEARING MATERIAL, PROVIDE 6" DEEP PENETRATION.

WHERE FOOTINGS ARE IN CLOSE PROXIMITY OF SEWERS, BOTTOM OF FOOTINGS SHALL BE AT LEAST 8" BELOW INVERT ELEVATION OF SEWERS.

EXCAVATIONS FREE OF WATER AT ALL TIMES.

USE LEAN CONCRETE (F'_c=1500 PSI) FOR OVER-EXCAVATION OF FOOTINGS AND REPLACEMENT OF WEAKENED SOIL.

PROVIDE POSITIVE DRAINAGE AWAY FROM EXCAVATIONS SO AS NOT TO ALLOW STANDING WATER FOR LONG PERIODS OF TIME.

PROVIDE A 10 MIL THICK VAPOR BARRIER BETWEEN THE COMPACTED BASE AND CONCRETE SLAB.

DO NOT PUNCTURE THE VAPOR BARRIER. LAP AND TAPE ENDS.

PERFORM ALL SITEWORK UNDER THE DIRECT SUPERVISION OF A GEOTECHNICAL ENGINEER.

ASCE 7-16 / ULTIMATE COMPONENT AND CLADDING ROOF PRESSURE

ZONE	EFFECTIVE WIND AREA	COEFFICIENT	ULTIMATE DWP		NOMINAL DWP	
			PNET (psf)	PNET (psf)	PNET (psf)	PNET (psf)
1'	10	0.90	17.13	-38.55	10.28	-23.13
1'	20	0.90	16.00	-38.55	9.60	-23.13
1'	50	0.90	16.00	-38.55	9.60	-23.13
1'	100	0.90	16.00	-38.55	9.60	-23.13
1	10	0.90	17.13	-67.10	10.28	-40.26
1	20	0.90	16.00	-63.53	9.60	-38.12
1	50	0.90	16.00	-56.39	9.60	-33.84
1	100	0.90	16.00	-52.82	9.60	-31.69
2	10	0.90	17.13	-88.52	10.28	-53.11
2	20	0.90	16.00	-83.16	9.60	-49.90
2	50	0.90	16.00	-74.24	9.60	-44.54
2	100	0.90	16.00	-68.89	9.60	-41.33
3	10	0.90	17.13	-120.64	10.28	-72.38
3	20	0.90	16.00	-109.93	9.60	-65.96
3	50	0.90	16.00	-93.87	9.60	-56.32
3	100	0.90	16.00	-81.38	9.60	-48.83

ASCE 7-16 / ULTIMATE COMPONENT AND CLADDING WALL PRESSURE

ZONE	EFFECTIVE WIND AREA	COEFFICIENT	ULTIMATE DWP		NOMINAL DWP	
			PNET (psf)	PNET (psf)	PNET (psf)	PNET (psf)
4	10	0.90	42.12	-45.69	25.27	-27.41
4	20	0.90	40.33	-43.90	24.20	-26.34
4	50	0.90	37.48	-41.40	22.49	-24.84
4	100	0.90	35.69	-39.26	21.42	-23.56
4	200	0.90	34.26	-37.83	20.56	-22.70
5	10	0.90	42.12	-56.39	25.27	-33.84
5	20	0.90	40.33	-52.82	24.20	-31.69
5	50	0.90	37.48	-47.47	22.49	-28.48
5	100	0.90	35.69	-43.90	21.42	-26.34
5	200	0.90	34.26	-40.33	20.56	-24.20

GENERAL NOTES

OCOEE WWTP - ELECTRIC UPGRADE AND EXPANSION

1800 A.D. MINIS RD.

OCOEE, FL 34761

THIS SHEET NOT VALID FOR CONSTRUCTION WITHOUT COMPLETE SET OF PLANS. SEE GENERAL NOTES FOR MASTER LEGEND

Sheet No.

S001

DESIGNED: V.O.R.

Drawn: V.O.R.

Checked: J.M.O.

Job No.: 06023

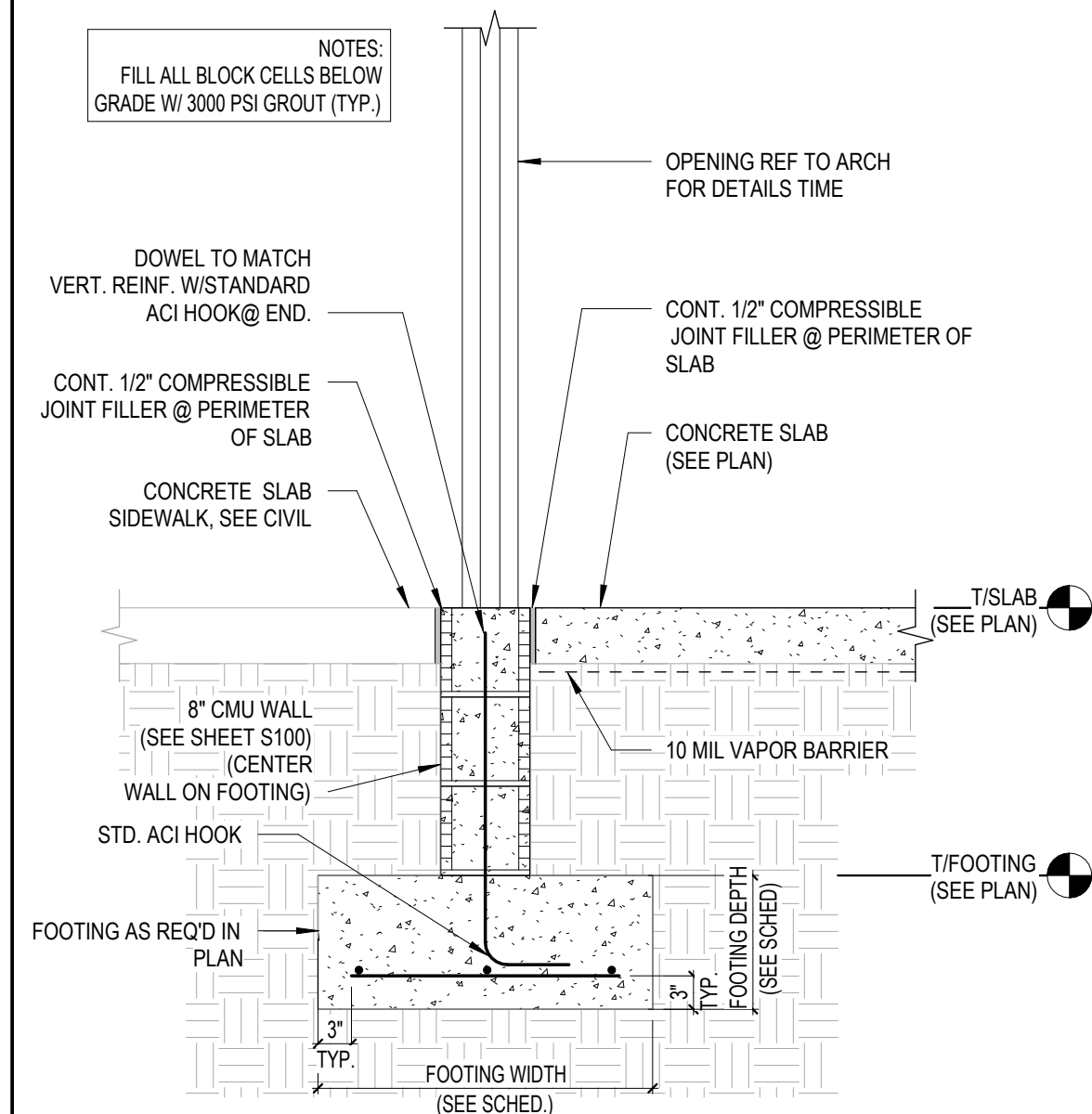
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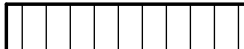
Revision

No.

DATE

Page 1275 of 1460

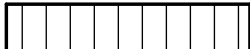


MASONRY WALL REINFORCEMENT SCHEDULE			
MARK	LEGEND	THICKNESS	REINFORCING
MW-1		8" CMU	#5 @ 32" O.C. VERT.
MW-2		8" CMU	#5 VERTICAL @ EACH CELL GROUTED SOLID.
NOTES: 1. WALL SEGMENTS SHALL BE REINFORCED WITH 9 GA. STANDARD GALVANIZED LATERAL REINFORCING @ 16" O.C. HORIZONTAL. EXTEND REINFORCING 6" INTO POURED ELEMENTS AND AROUND ENCASED STEEL. PRODUCT BY WIREBOND OR APPROVED EQUAL. 2. ADJACENT TO ANY EXTERIOR WALL OPENING, PROVIDE 8" X 16" FULLY GROUTED CMU PIER W/ (1) #5 EACH CELL FULL HEIGHT. 3. ALL MASONRY REINFORCED CELLS SHALL BE FILLED WITH 3,000 PSI GROUT MIX.			

FOUNDATION SCHEDULE			
MARK	DIMENSIONS (LxWxD)	REINFORCEMENT	REMARK
WF2.0	2'-0" X 12" CONT. X 12"	(3) #5 CONT. & #5@12" O.C. TRANSV.	REFER TO I10/S100
FOUNDATION NOTES: 1. TOP OF FOOTINGS @ EL. (-2'-0") MIN. BELOW TOP OF SLAB UNLESS NOTED OTHERWISE. BELOW ADJACENT FINISH GRADE. VERIFY ALL TOP OF FOOTING ELEVATIONS W/ ARCHITECTURAL DRAWINGS PRIOR TO FABRICATION AND CONSTRUCTION. 2. SEE ARCH. DWG FOR ANY WALL LOCATIONS AND/OR DIMENSIONS NOT SHOWN. 3. FOUNDATION DESIGN IS BASED ON THE FOLLOWING ASSUMPTIONS: A GEOTECHNICAL ENGINEER SHALL BE EMPLOYED PRIOR TO THE START OF CONSTRUCTION TO INVESTIGATE SUBSURFACE CONDITIONS. IF THE GEOTECHNICAL REPORT INDICATES THAT THESE ASSUMPTIONS LISTED BELOW ARE INCORRECT PLEASE NOTIFY ENGINEER IMMEDIATELY. 4. THE SOIL BEARING CAPACITY AND CONSISTENCY SHALL BE VERIFIED FOR THE BUILDING LIMITS BY A REGISTERED GEOTECHNICAL ENGINEER WHEN FOUNDATION EXCAVATIONS HAVE BEEN CARRIED DOWN TO THE PROPOSED ELEVATIONS. 5. WHERE FOOTING EXCAVATIONS ARE TO REMAIN OPEN AND MAY BE EXPOSED TO RAINFALL, THE EXCAVATIONS SHALL BE UNDERCUT AND A 4 INCH THICK MUD MAT OF 2000 PSI CONCRETE SHALL BE PLACED IN THE BOTTOM TO PROTECT THE BEARING SOILS PER GEOTECHNICAL ENGINEER RECOMMENDATIONS. 6. WHERE FOOTING STEPS ARE NECESSARY, THEY SHALL BE NO STEEPER THAN 1 VERTICAL TO 2 HORIZONTAL, UNLESS SHOWN OTHERWISE ON PLANS. 7. PROVIDE A 10 MIL THICK VAPOR BARRIER BETWEEN THE COMPACTED BASE AND CONCRETE SLAB. 8. DO NOT PUNCTURE THE VAPOR BARRIER. LAP AND TAPE ENDS.			

LEGEND	
WFX.0	DENOTES CONTINUOUS WALL FOUNDATION, REFER TO SCHEDULE FOR DIMENSION AND REINFORCEMENT.
MW.#	DENOTES MASONRY WALL, REFER TO SCHEDULE FOR DIMENSION AND REINFORCEMENT.

MASONRY WALL REINFORCEMENT SCHEDULE

MARK	LEGEND	THICKNESS	REINFORCING
MW-1		8" CMU	#5 @ 32" O.C. VERT.
MW-2		8" CMU	#5 VERTICAL @ EACH CELL GROUTED SOLID.

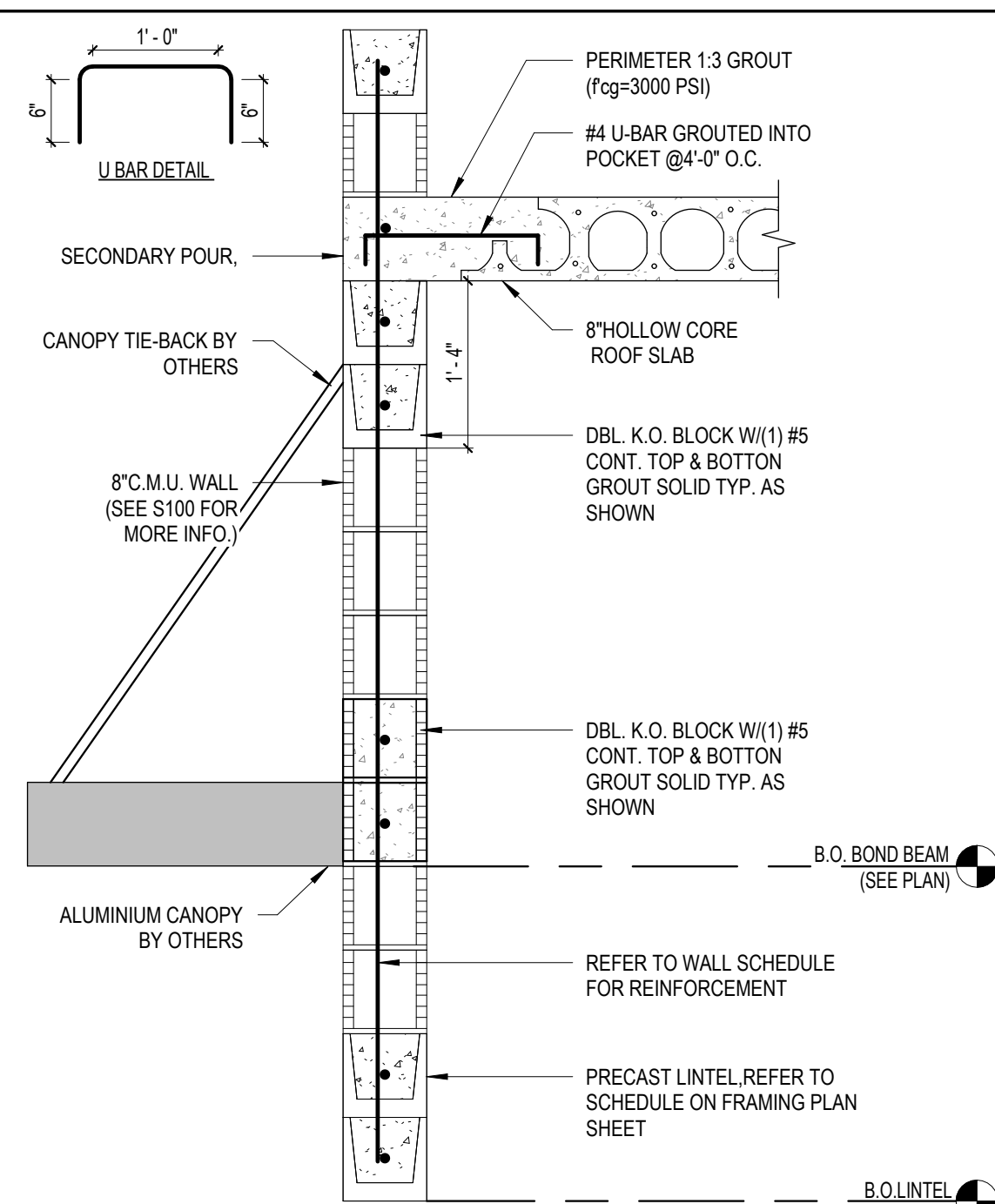
NOTES:

1. WALL SEGMENTS SHALL BE REINFORCED WITH 9 GA. STANDARD GALVANIZED LATERAL REINFORCING @ 16" O.C. HORIZONTAL. EXTEND REINFORCING 8" INTO POURED ELEMENTS AND AROUND ENCASED STEEL. PRODUCT BY WIREBOND OR APPROVED EQUAL.
2. ADJACENT TO ANY EXTERIOR WALL OPENING, PROVIDE 8" X 16" FULLY GROUTED CMU PIER W/ (1) #5 EACH CELL FULL HEIGHT.
3. ALL MASONRY REINFORCED CELLS SHALL BE FILLED WITH 3,000 PSI GROUT MIX.

THIS SHEET NOT VALID FOR
CONSTRUCTION WITHOUT
COMPLETE SET OF PLANS.
SEE GENERAL NOTES FOR
MASTER LEGEND

Sheet No.

S100



Left Diagram Labels:

- PERIMETER 1:3 GROUT (fg=3000 PSI)
- #4 BENT BAR GROUTED INTO KEYWAY @ 4'-0" O.C.
- T.O. BEARING (SEE PLAN)
- 8" HOLLOW CORE ROOF SLAB
- #3 CONT.
- 1'-0"
- 4"
- 1'-4"
- DBL. K.O. BLOCK W/ (1) #5 CONT. TOP & BOTTOM GROUT SOLID TYP. AS SHOWN
- 8" C.M.U. WALL. (SEE S100 FOR MORE INFO.)
- REFER TO WALL SCHEDULE FOR REINFORCEMENT

Right Diagram Labels:

- SINGLE KO BLOCK W/ (1) #5 CONT. GROUT SOLID
- PERIMETER 1:3 GROUT (fg=3000 PSI)
- #4 BENT BAR GROUTED INTO KEYWAY @ 4'-0" O.C.
- T.O. BEARING (SEE PLAN)
- 8" HOLLOW CORE ROOF SLAB
- #3 CONT.
- 1'-0"
- 4"
- 1'-4"
- DBL. K.O. BLOCK W/ (1) #5 CONT. TOP & BOTTOM GROUT SOLID TYP. AS SHOWN
- REFER TO WALL SCHEDULE FOR REINFORCEMENT
- DBL. K.O. BLOCK W/ (1) #5 CONT. TOP & BOTTOM GROUT SOLID TYP. AS SHOWN
- B.O. BOND BEAM (SEE PLAN)
- PRECAST LINTEL REFER TO SCHEDULE ON FRAMING PLAN SHEET
- B.O. LINTEL (SEE PLAN)
- ALUMINIUM CANOPY BY OTHERS
- 8" C.M.U. WALL. (SEE S100 FOR MORE INFO.)
- CANOPY TIE-BACK BY OTHERS

TYPE DESIGNATION:

F = FILLED WITH GROUT / U = UNFILLED

8F16-1B/1T

NOMINAL HEIGHT
NOMINAL WIDTH

NUMBER OF #5 REBAR AT BOTTOM OF LINTEL CAVITY

NUMBER OF #5 REBAR AT TOP

SEE SCHEDULE

#5 REBAR AT TOP MIN. (1) REQ'D.
1½" CLR.

GROUT

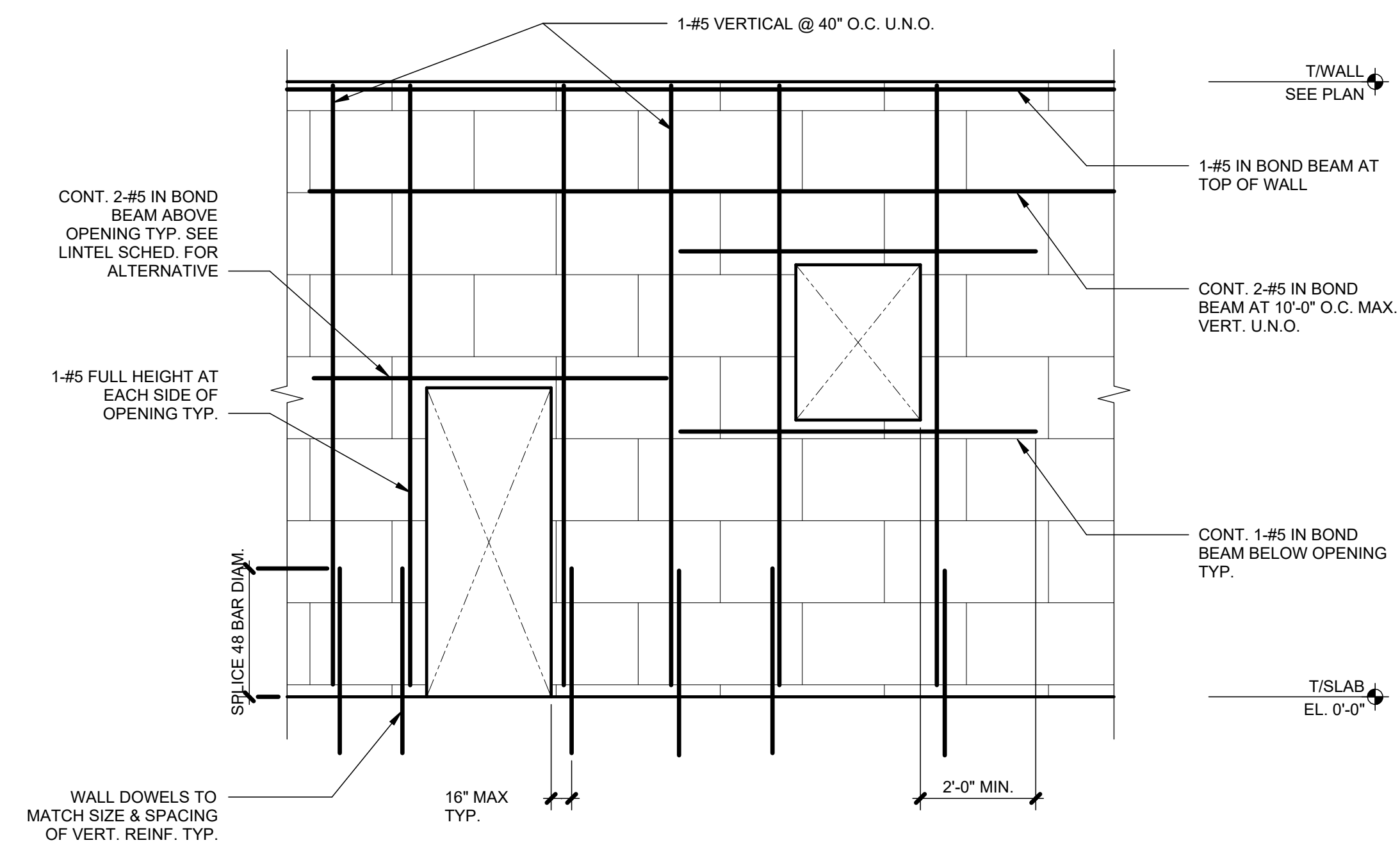
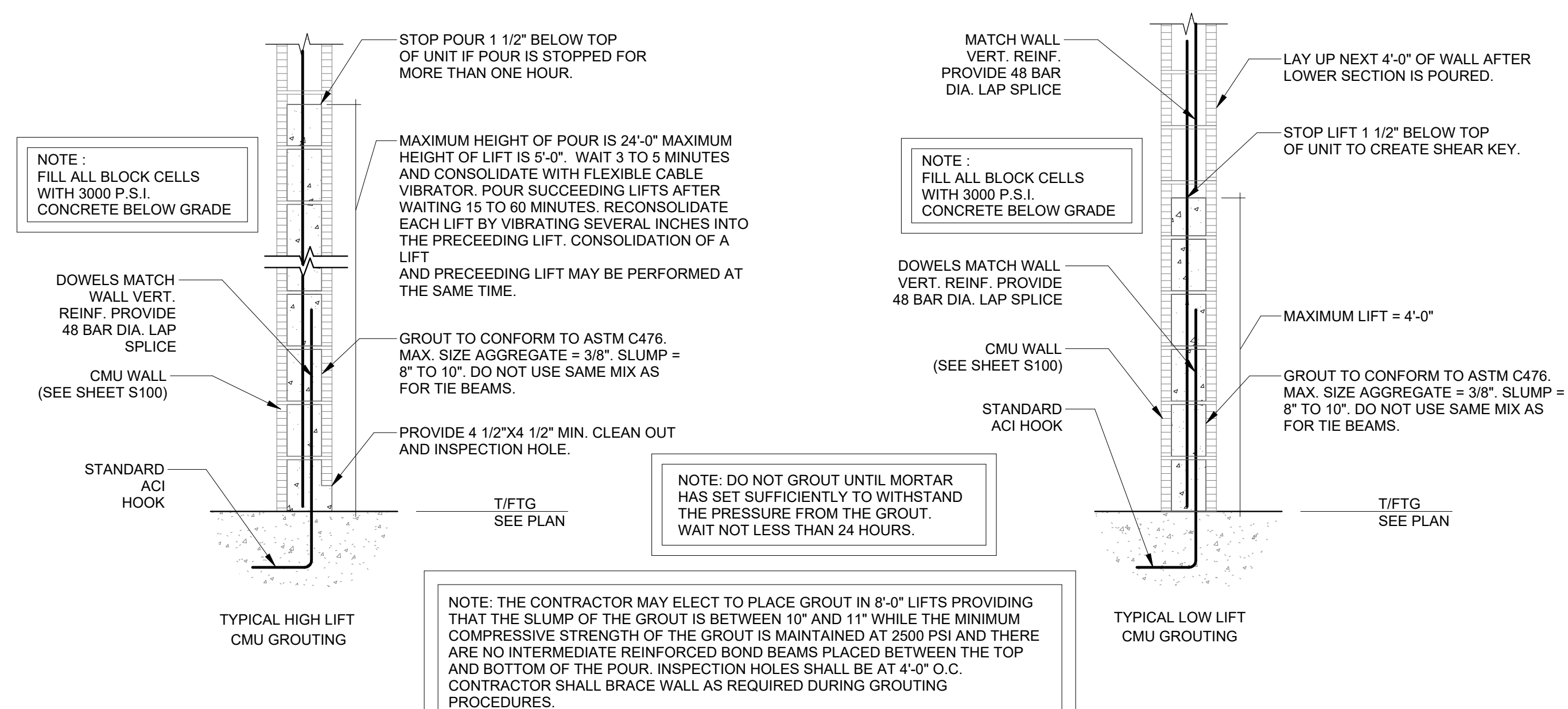
#5 REBAR AT BOTTOM OF LINTEL CAVITY

BOTTOM REINFORCING PROVIDED IN LINTEL (VARIES)

7-5/8"

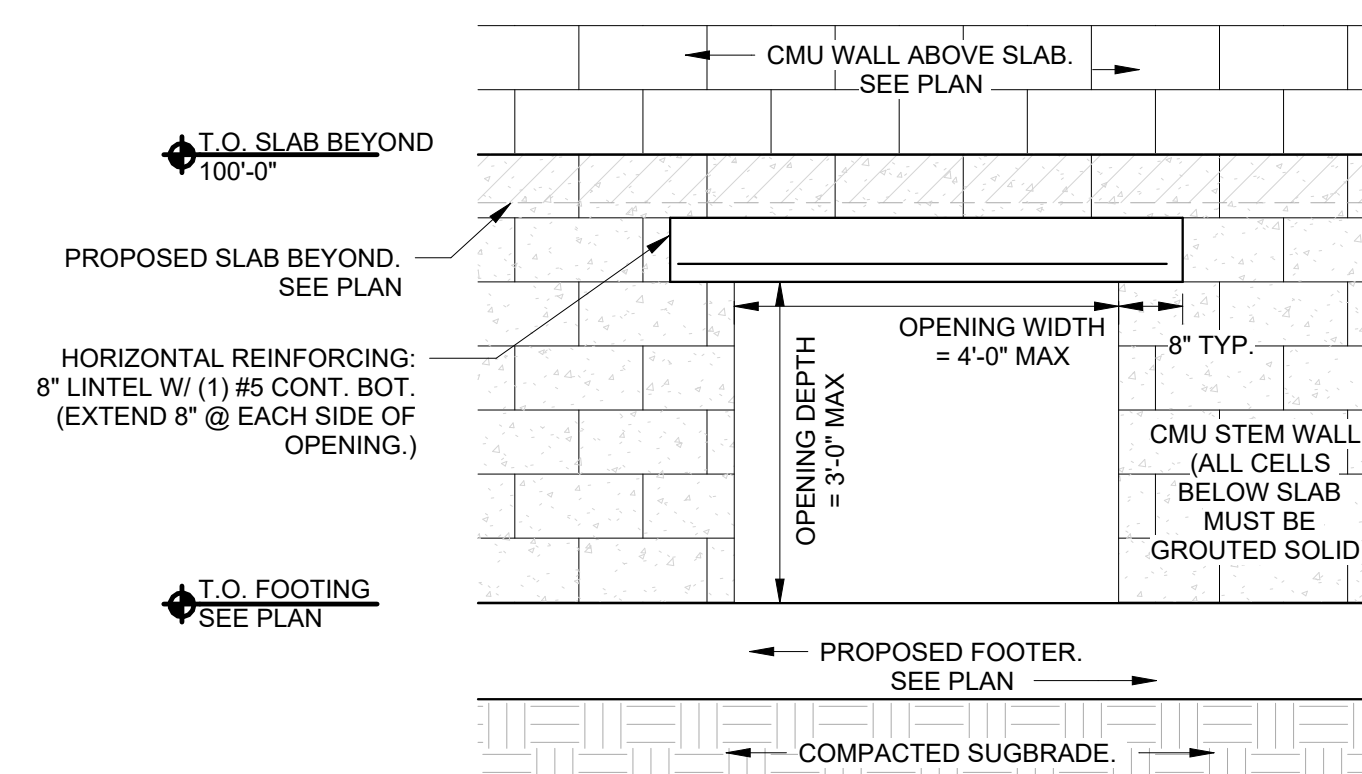
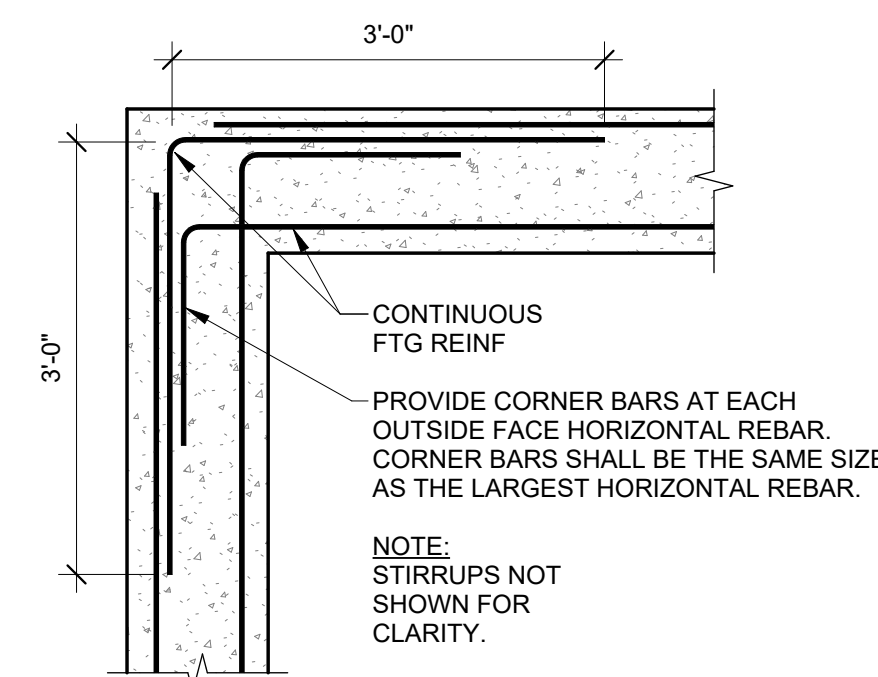
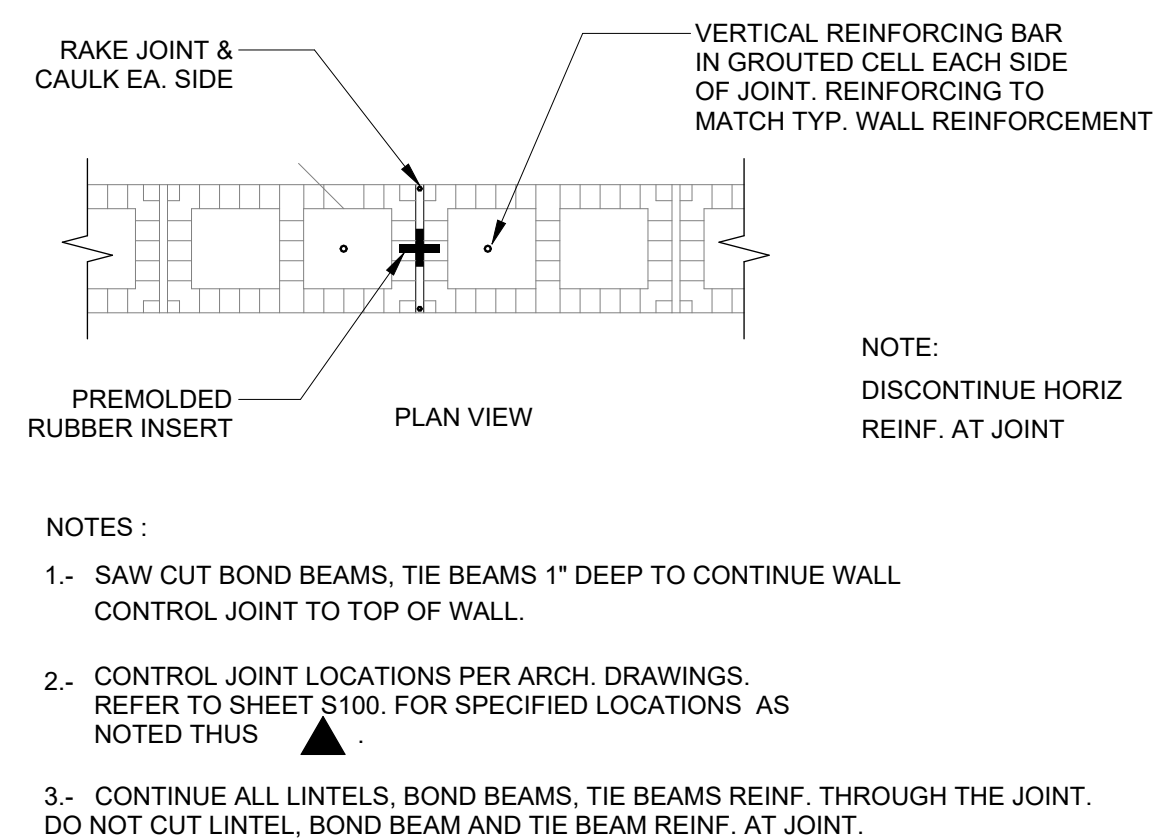
8" NOMINAL WIDTH

Page 1278 of 1460



H1	CMU WALL GROUTING DETAIL
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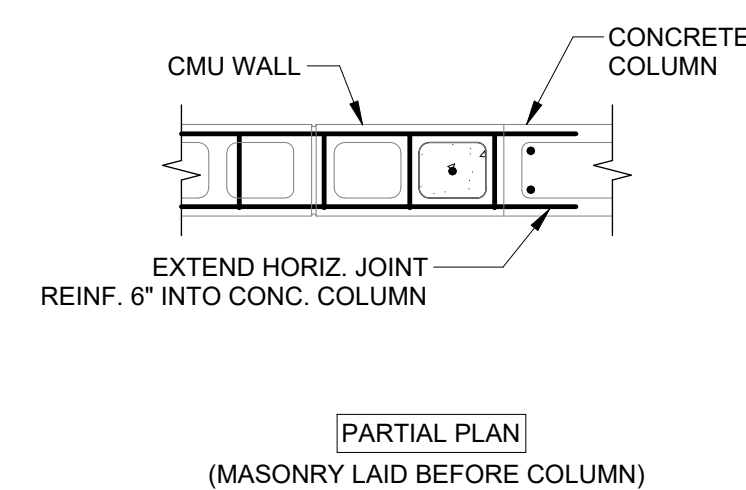
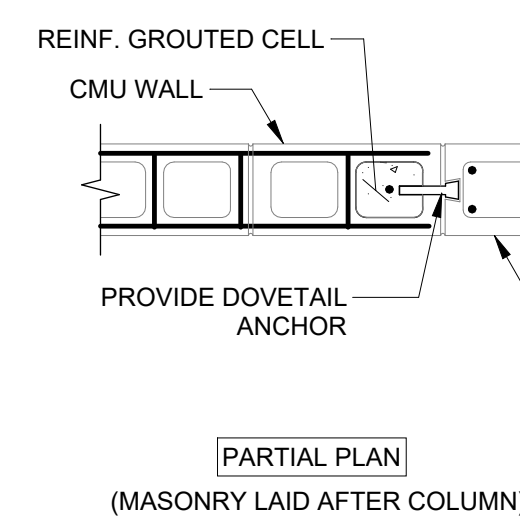
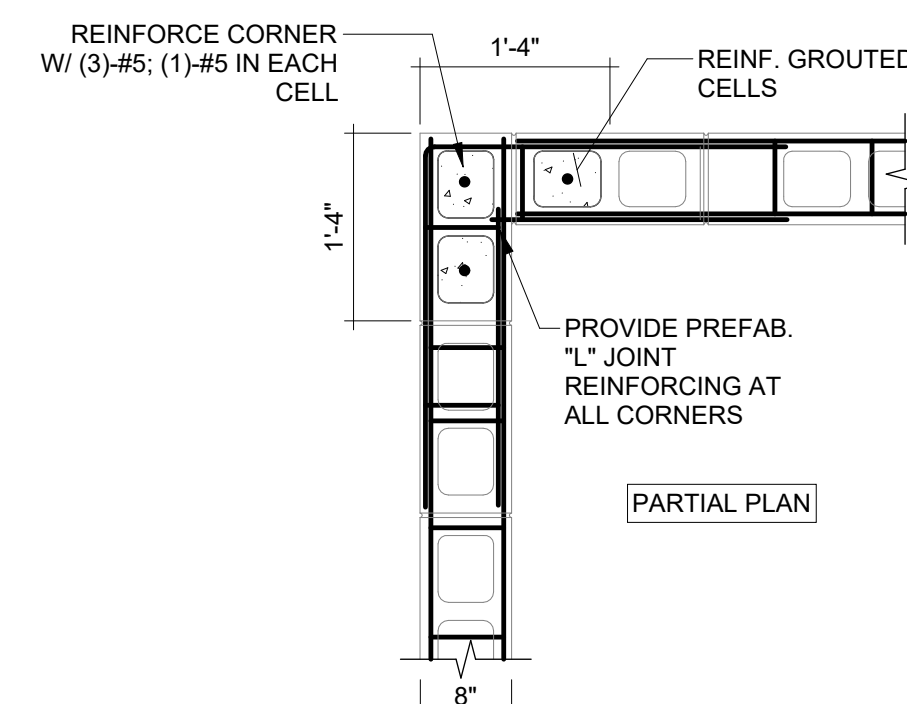
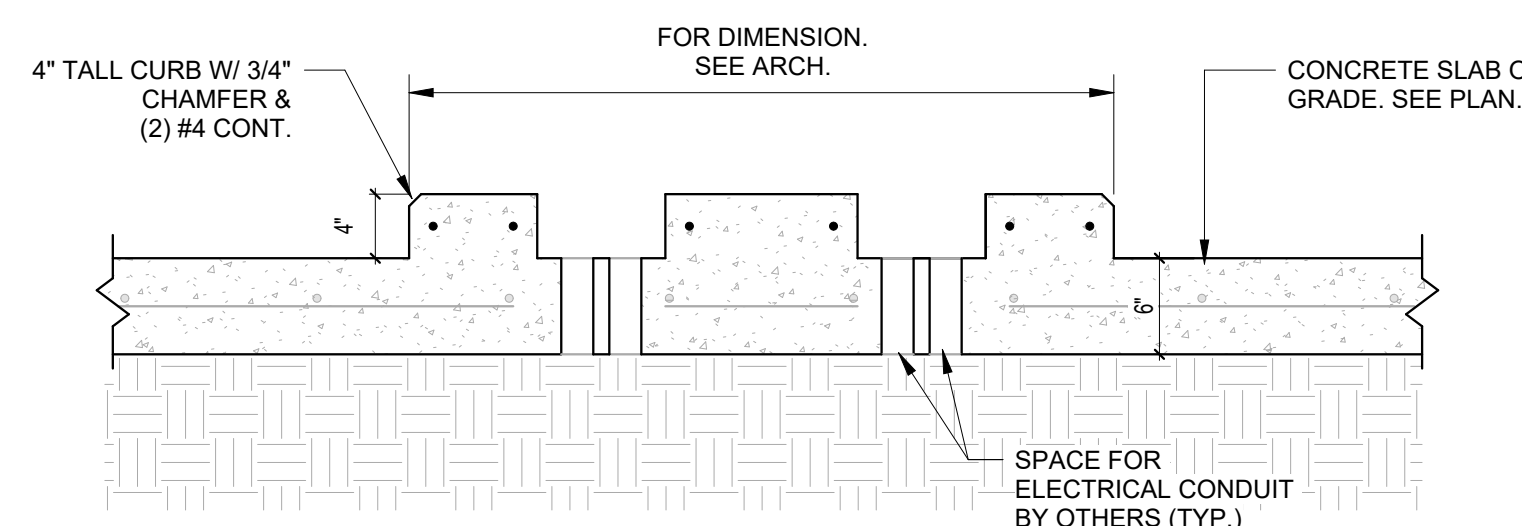
H9	CMU WALL REINFORCEMENT DETAIL
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D1	CMU CONTROL JOINT
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D5	TYP. CONTINUITY CORNER
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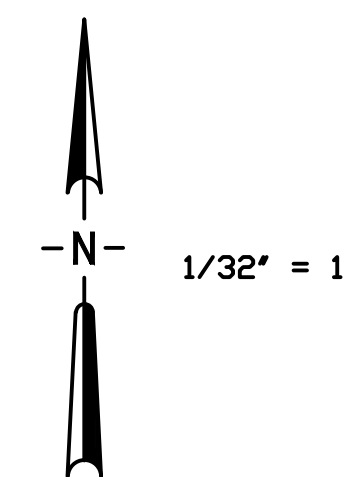
D9	TYP. PRE-CAST LINTEL @ CONDUIT BANK DETAIL
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A1	CURB DETAIL
----	-------------

A5	CMU WALL PLAN DETAIL
----	----------------------

ABBREVIATIONS						GENERAL NOTES
A ACB ACCU AF AFF AFG AHU AIC ALUM AM ANN ANSI AR ASA AS AT ATS AUX AWG	AMBER, AMPERE, ALARM ALTERNATING CURRENT AIR CIRCUIT CURRENT AIR COOLED CONDENSING UNIT AMPERE FRAME ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AIR HANDLING UNIT AMPS INTERRUPTING CAPACITY ALUMINUM AMMETER ANNUNCIATOR AMERICAN NATIONAL STANDARDS INSTITUTE ALARM RELAY AMERICAN STANDARDS ASSOCIATION AMMETER SWITCH AMPERE TRIP AUTOMATIC TRANSFER SWITCH AUXILIARY AMERICAN WIRE GAGE	GALV GB GD GEN GFI GND GFR	GALVANIZED GENERATOR BREAKER GROUND DETECTOR GENERATOR GROUND FAULT INTERRUPTER GROUND GROUND FAULT RELAY	R REC RES RGS RMS RS RT RTD RTU	RED, RAISE, RELAY OR REVERSE RECEPTACLE RESISTOR RIGID GALVANIZED STEEL RDOT-MEAN-SQUARE RAPID START REPEATING TIMER RESISTANCE TYPE TEMP DETECTOR REMOTE TERMINAL UNIT	1. ALL ELECTRICAL WORK SHALL COMPLY WITH N.E.C AND LOCAL CODES. 2. DO NOT SCALE THE ELECTRICAL DRAWINGS. REFER TO THE MECHANICAL, STRUCTURAL, CIVIL AND ARCHITECTURAL DWGS AND APPROVED SHOP DRAWINGS FOR THE EXACT LOCATION OF ALL EQUIPMENT. 3. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF TERMINAL BOXES, PANELBOARDS, CONDUITS, CONTROL PANELS ETC, AGAINST SHOP DRAWINGS BEFORE STUBBING UP CONDUITS. 4. CONTRACTOR SHALL PROVIDE ADDITIONAL PULLBOXES WHERE REQUIRED BY THE NEC AND/OR TO MAKE A WORKABLE INSTALLATION. 5. CONDUIT ENTRY INTO ELECTRICAL EQUIPMENT SHALL BE DIRECTLY BELOW OR ABOVE AND BE LOCATED EQUALLY SPACED FROM EQUIPMENT CENTERLINE
B BC BITL BKR BLDG BR BT	BLUE BARE COPPER DR BATTERY CHARGER BASIC IMPULSE LEVEL BREAKER BUILDING BRAKE BEARING TEMPERATURE	I/O IEEE	INPUT/OUTPUT INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS ILLUMINATING ENGINEERING SOCIETY INSTRUMENTATION ISOLATION	SCH SEC SH SN SP SPDT SPST SS ST SUPV SV SW SWBD SWGR	SCHEDULE SECONDARY SPACE HEATER OR SHIELD SOLID NEUTRAL SINGLE POLE SINGLE POLE DOUBLE THROW SINGLE POLE SINGLE THROW SELECTOR SWITCH OR STAINLESS STEEL STATION TIE BREAKER SUPERVISORY CONTROL SOLENOID VALVE SWITCH SWITCHBOARD SWITCHGEAR	
C °C CAB CAP CB CB"A"	CLOSE, COUNTER, CONTACTOR OR CONDUIT DEGREES CENTIGRADE CABINET CAPACITOR CIRCUIT BREAKER CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN AND CLOSED WHEN BREAKER IS CLOSED OR TRIPPED) CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN AND OPEN WHEN BREAKER IS CLOSED OR TRIPPED) CERTIFIED BALLAST MANUFACTURERS CELL INTERLOCK CIRCUIT CHLDRIE CEILING CONCRETE CONDUCTOR CONNECTION CABLE OPERATED SWITCH CONTROL PANEL CONTROL POWER TRANSFORMER CURRENT OR CONTROL RELAY CONTROL STATION CYCLE TIMER OR CURRENT TRANSFORMER CYCLE TIMER CLUTCH CYCLE TIMER MOTOR COPPER COLD WATER PIPE	J	JUNCTION BOX	T TACH TB TC TD TEL TEMP TM TQ TTB TTC TYP	THERMOSTAT, TIMER, OR TOTALIZER TACHOMETER TERMINAL BLOCK TIMER CLUTCH OR TIME CLOCK TIME DELAY RELAY TELEPHONE TEMPERATURE TIMER MOTOR TORQUE TELEPHONE TERMINAL BOX OR BOARD TELEPHONE TERMINAL CABINET TYPICAL	
CB"B"		K KV KVA KVAR KW KWH	KEY INTERLOCK KILOVOLT KILOVOLT AMPERE KILOVAR KILOWATT KILOWATT HOUR	UL UG UDN UV UPS	UNDERWRITERS LABORATORIES UNDERGROUND UNLESS OTHERWISE NOTED UNDER VOLTAGE UNINTERRUPTIBLE POWER SUPPLY	
CBM CI CKT CL2 CLG CONC COND CONN COS CP CPT CR CS CT CTC CTM CU CWP		L LA LC LDR LS LT LTG LWCO	LOW, LEVEL LIGHTNING ARRESTED LIGHTING CONTRACTOR LOCAL-OFF-REMOTE LIMIT OR LEVEL SWITCH LIGHT LIGHTING LOW WATER CUTOFF	V VA VAR VFD VLS VM VPI VS VSC VSD	VOLTS VOLT AMPERE VARMETER VARIABLE FREQUENCY DRIVE VALVE LIMIT SWITCH VOLT METER VALVE POSITION INDICATOR VOLT METER SWITCH VARIABLE SPEED CONTROLLER VARIABLE SPEED DRIVE	
DC DIA DI DM DN DO DPDT DPST DPR DPS DS DVLS	DIRECT CURRENT DIAMETER DOOR INTERLOCK DAMPER MOTOR OR DEMAND METER DOWN DRAW OUT DOUBLE POLE DOUBLE THROW DOUBLE POLE SINGLE THROW DIFFERENTIAL PRESSURE REGULATOR DIFFERENTIAL PRESSURE SWITCH DISCONNECT SWITCH DISCHARGE VALVE LIMIT SWITCH	M MA MAX MCB MCC MCM MCP MD MFM MFR MH MIN MLD MOV MPR MS MSH MTD MTS MV MVA	MAGNETIC MOTOR STARTER MILLIAMPERE MAXIMUM MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER THOUSAND CIRCULAR MIL MOTOR CIRCUIT PROTECTOR MOISTURE DETECTOR MAGNETIC FLOW METER MANUFACTURER MANHOLE, MOUNTING HEIGHT OR METAL HALIDE MINIMUM MAIN LUGS ONLY MOTOR OPERATED VALVE MOTOR PROTECTION RELAY MANUAL MOTOR STARTER MOTOR SPACE HEATER MOUNTED MANUAL TRANSFER SWITCH MILLIVOLT OR MERCURY VAPOR MEGA VOLT AMPERE	W WH WM WP WT	WHITE, WATTS OR WIRE WATTHOUR METER WATT METER WEATHER PROOF WATER TIGHT	
EC EF ELEC EL ELR EM EMH EMT ENCL EO EP ES ESB ETM EUH EVA EVC EVH EXH EXIST	EMPTY CONDUIT EXHAUST FAN ELECTRICAL ELEVATION EMERGENCY LOCKOUT RELAY EMERGENCY ELECTRICAL MANHOLE ELECTRICAL METALLIC TUBING ENCLOSURE ELECTRICALLY OPERATED EXPLOSION PROOF ELECTRODE RELAY END SWITCH ENERGY SAVING BALLAST ELAPSED TIME METER ELECTRIC UNIT HEATER ELECTRIC VALVE ACTUATOR ELECTRIC WATER COOLER ELECTRIC WATER HEATER EXHAUST EXISTING	N NC NECA NEC NEMA NF NFPA NIC NO NTS	NEUTRAL NORMALLY CLOSED NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION NATIONAL ELECTRICAL CODE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION NON-FUSED NATIONAL FIRE PROTECTION ASSOCIATION NOT IN CONTRACT NORMALLY OPEN, NUMBER NOT TO SCALE	X XFMR XTMR	AUXILIARY RELAY TRANSFORMER TRANSFORMER	
F °F FAAP FACP FIT FLA FM FS FT	FORWARD DEGREES FAHRENHEIT FIRE ALARM ANNUNCIATION PANEL FIRE ALARM CONTROL PANEL FLOW INDICATING TRANSMITTER FULL LOAD AMPERES FACTORY MANUAL FLOW SWITCH FEET	O OC OFCI OH OL OLS OSHA	OPEN ON CENTER OWNER FURNISHED CONTRACTOR INSTALLED OVERHEAD OVERLOAD OVERLOADS OCCUPATIONAL SAFETY AND HEALTH ACT	Y	YELLOW	
		P PB PC PLC PF PH PNL PR PRGS PRI PRS	POLE PUSH BUTTON OR PULL BOX PHOTO CONTROL PROGRAMMABLE LOGIC CONTROLLER POWER FACTOR PHASE, CHEMICAL TERM PANEL PAIR PVC COATED RIGID GALVANIZED STEEL PRIMARY PROXIMITY SWITCH	ZS Ø	POSITION SWITCH PHASE	
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① EXISTING PB (CONSTRUCT
BRASS TAGS (TYP.)

SITE PLAN
1/32" = 1'

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SITE PLAN

COCEE WWTF

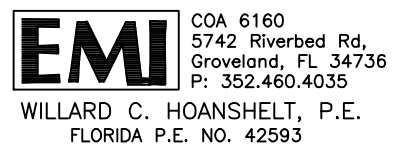
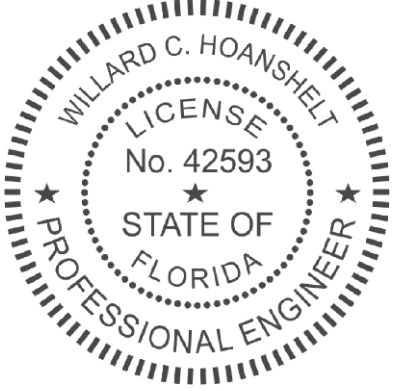
ELECTRICAL UPGRADE AND

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ORANGE COUNTY, FL

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E 03

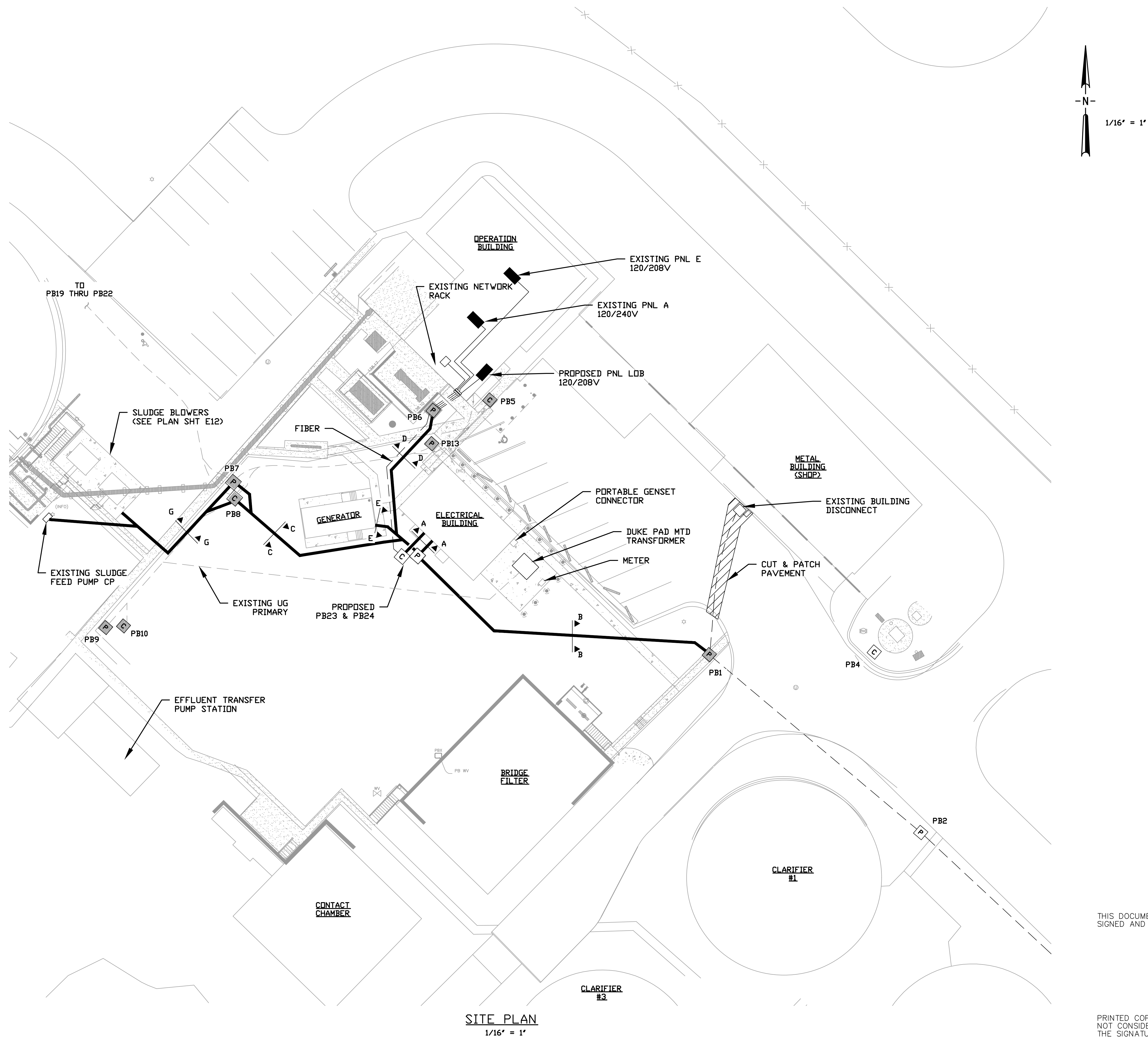
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Job No.: E12345	
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PARTIAL SITE PLAN 1

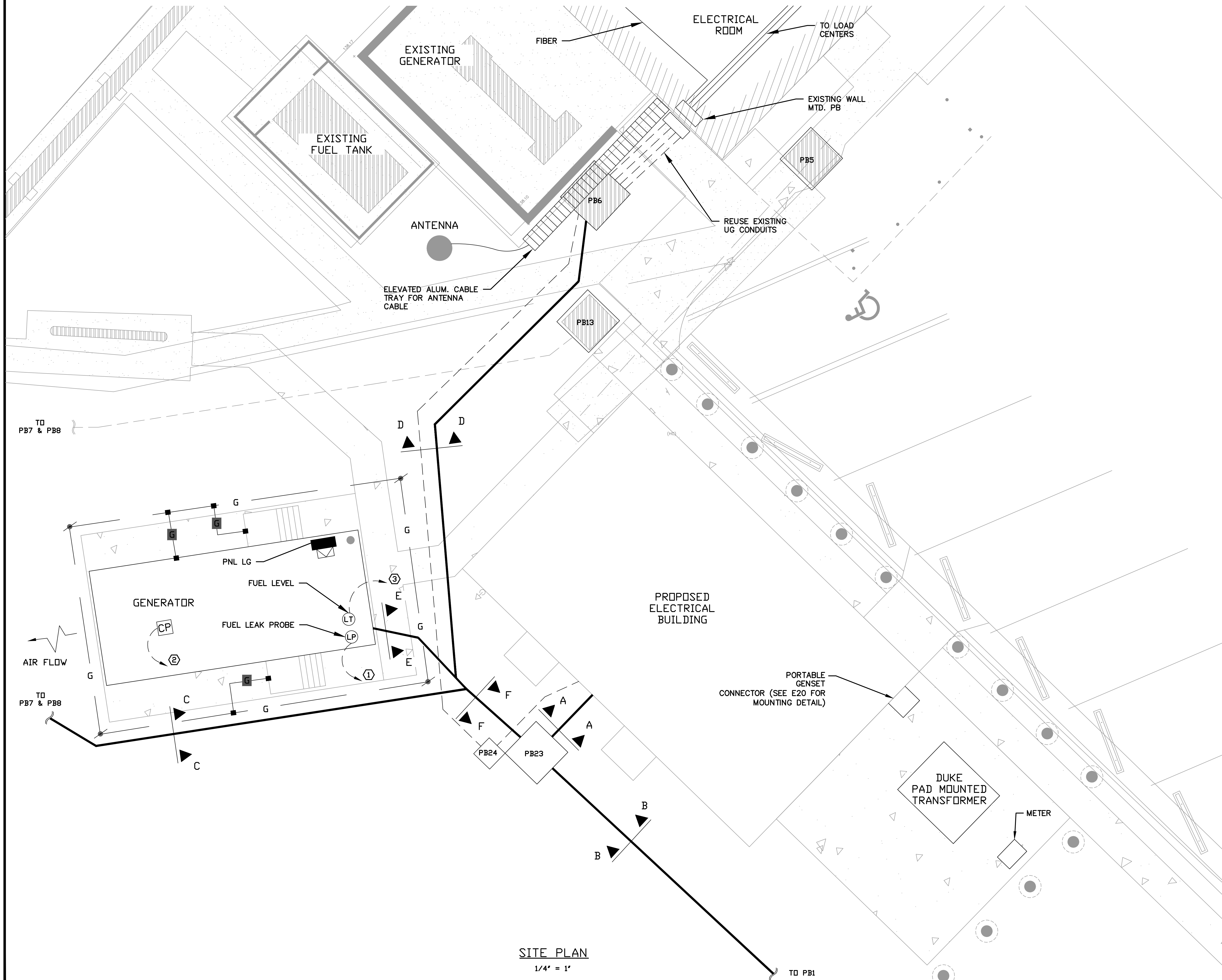
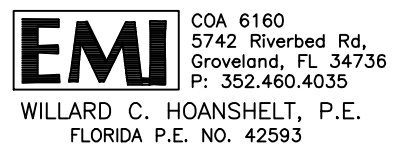
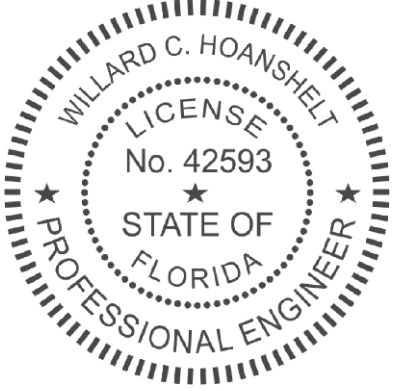
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SHEET NOTES

- ① 2#14-3/4' TO PLC-E1
- ② 12#14-3/4 TO PLC-E1
- ③ VENDOR CABLE-1' TO
FUEL PANEL IN ELECT.
BLDG

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PARTIAL SITE PLAN 2

OCOE WWTF

ELECTRICAL UPGRADE AND EXPANSION

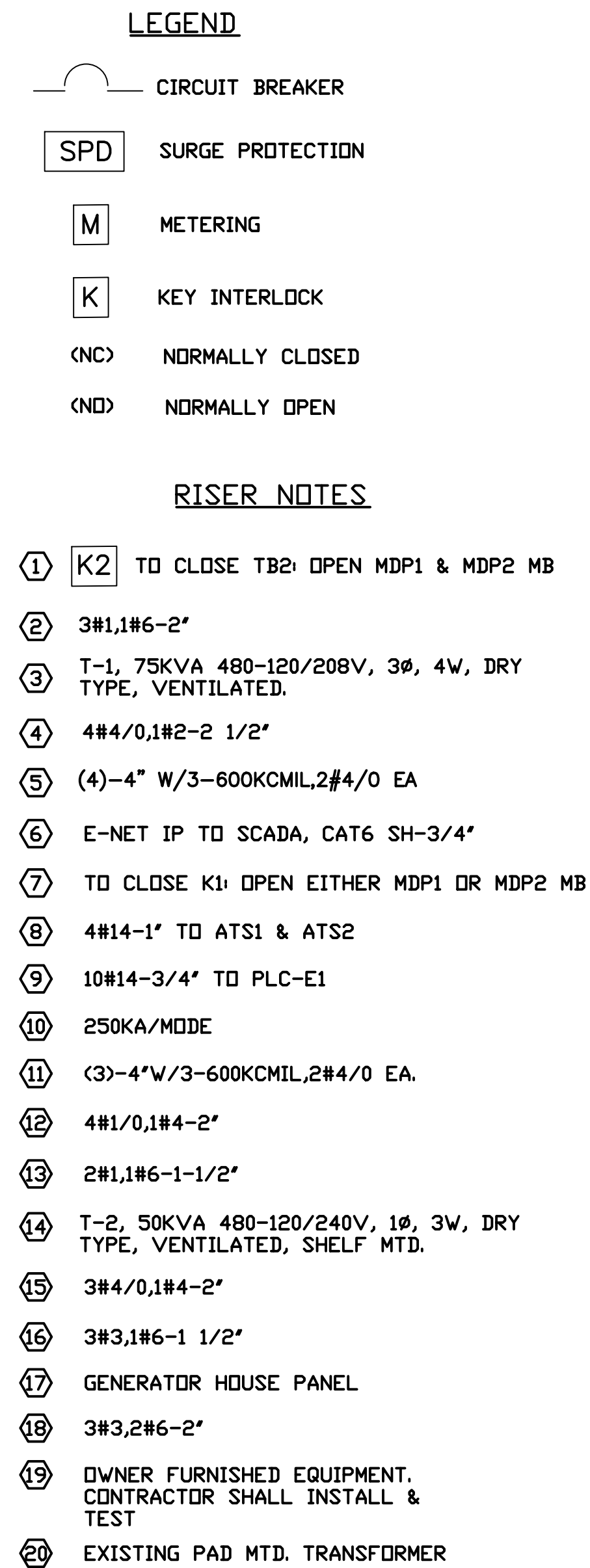
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- ① PROPOSED SPLICE BOX PB23 (SEE E2 FOR LOCATION)
- ② EXISTING PB-7 SPLICE TO EXISTING WIRE
- ③ 3#1/0,6#14,1#6-2-1/2"
- ④ EXISTING ON/OFF SWITCH
- ⑤ PROPOSED ON/OFF SWITCH (NEMA 4X)

Page 1286 of 1460



MCC-2 FRONT
VIEW

- ① PROPOSED SPLICE BOX PB23 <SEE E2 FOR LOCATION>
- ② EXISTING PB-7 SPLICE TO EXISTING WIRE
- ③ 3#1/0,6#14,1#6-2-1/2"
- ④ EXISTING ON/OFF SWITCH
- ⑤ PROPOSED ON/OFF SWITCH <NEMA 4X>

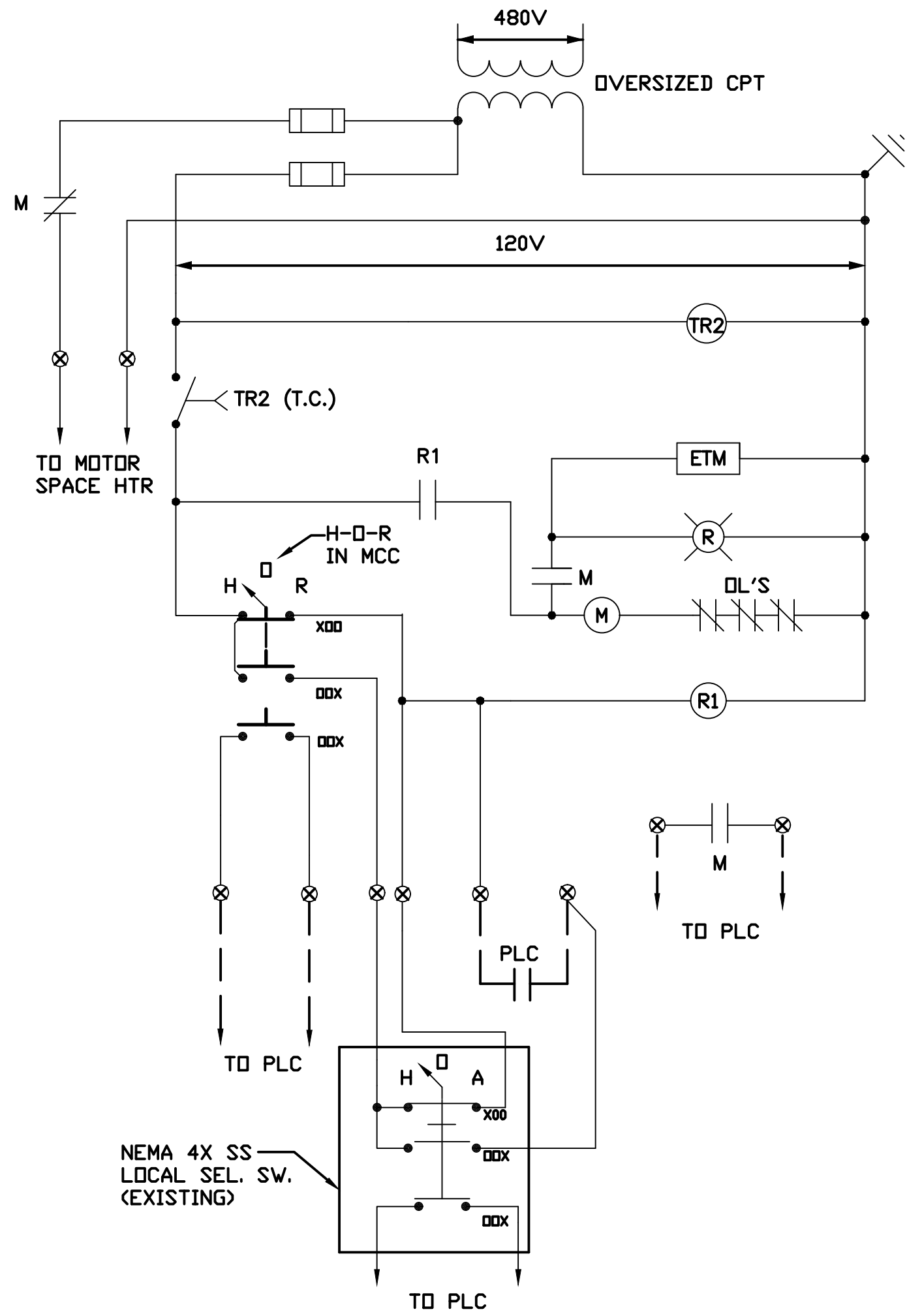
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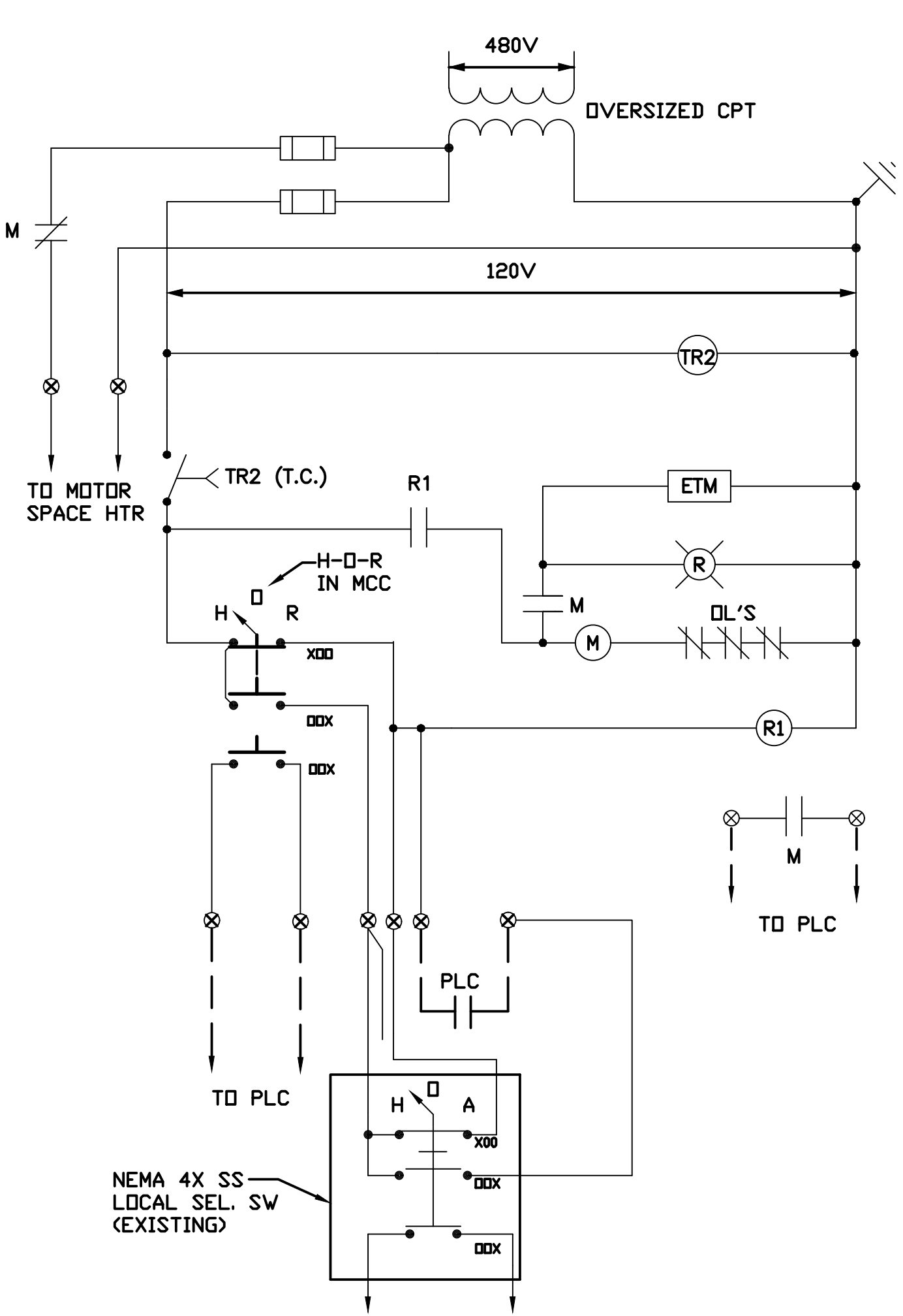
MCC-2 POWER RISER

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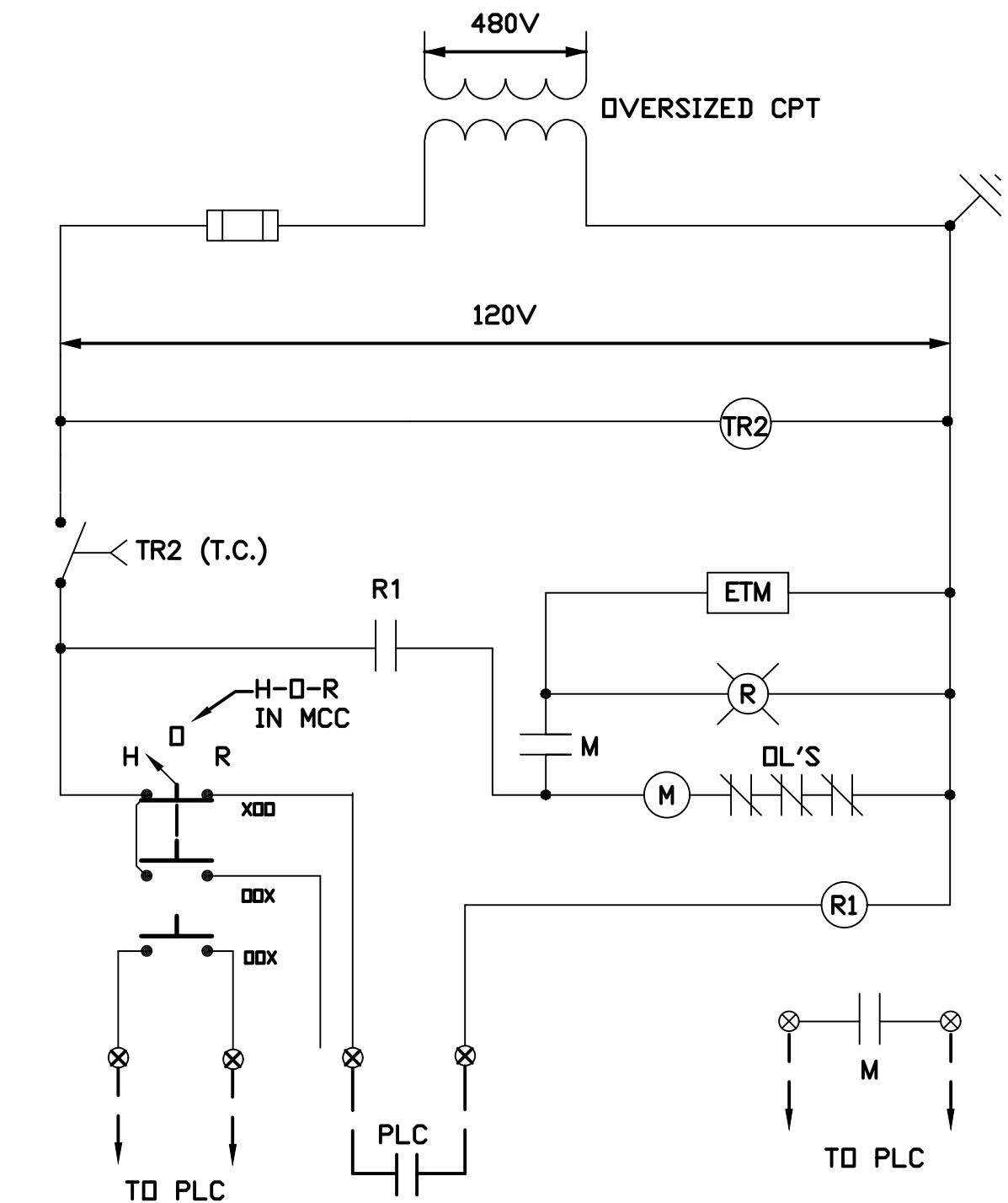
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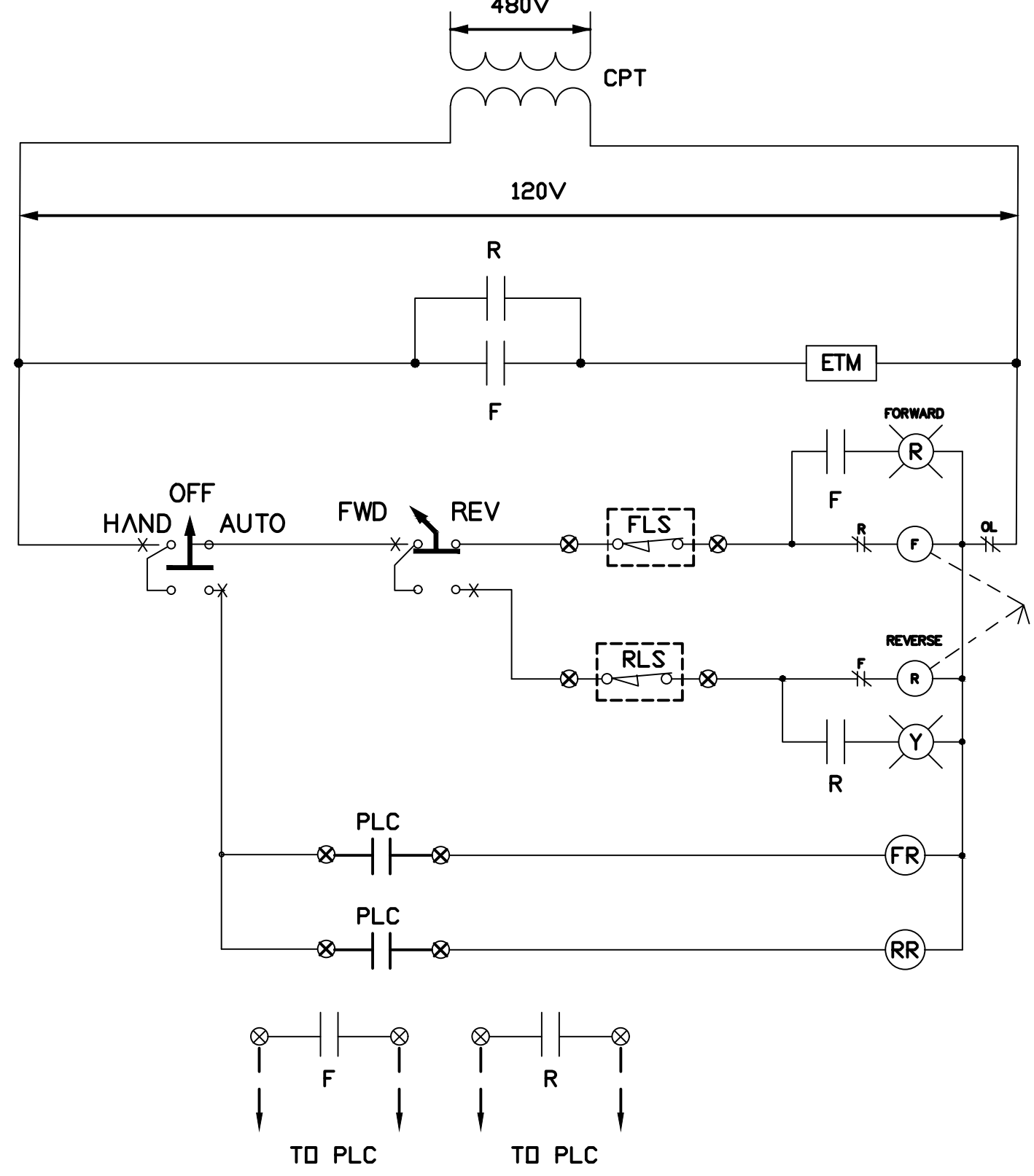
MP-1.2, 3 & 4 & SPARES
(VARIES WITH MANUFACTURER)



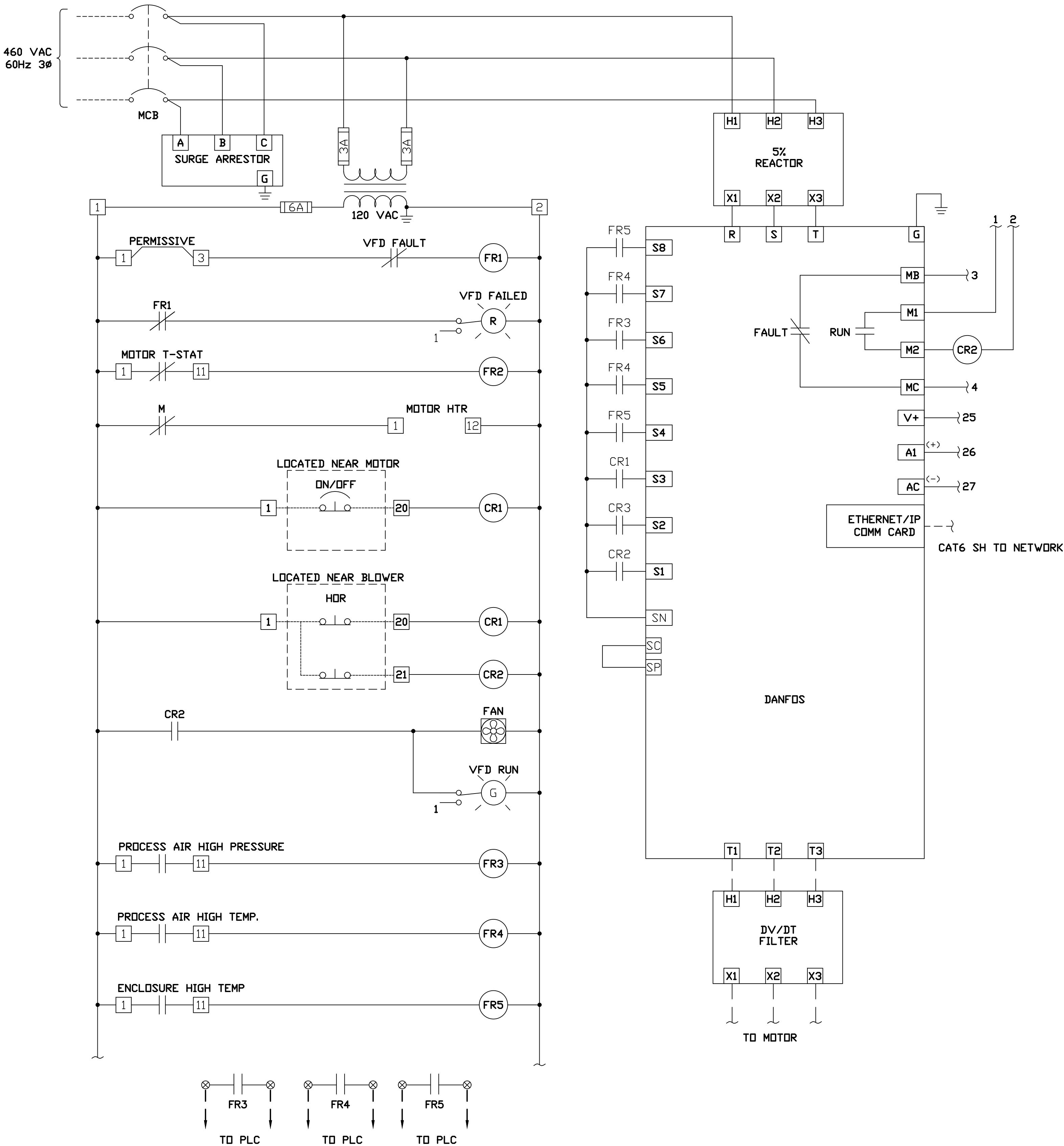
EP-1.2, 3, 4 & 5
(VARIES WITH MANUFACTURER)



OM-1.2, 3 & 4
(VARIES WITH MANUFACTURER)



OD-1 & 2 WEIRS
(VARIES WITH MANUFACTURER)



DITCH ROTORS & SLUDGE BLOWERS VFD

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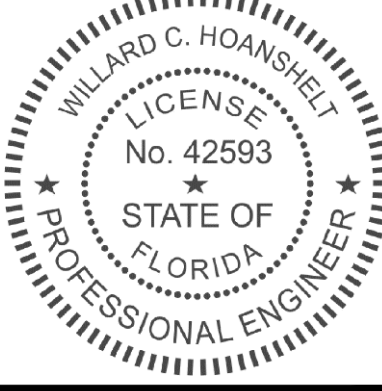
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State of Florida Licenses:
Engineer No. 3215
Surveyor No. LB7143
Architect No. AA26000926
Landscape No. LC000298



EMI
COA: 6160
5742 Riverbed Rd.,
Groveville, FL 34736
P: 352.460.4035
WILLARD C. HOANSHELT, P.E.
FLORIDA P.E. NO. 42593

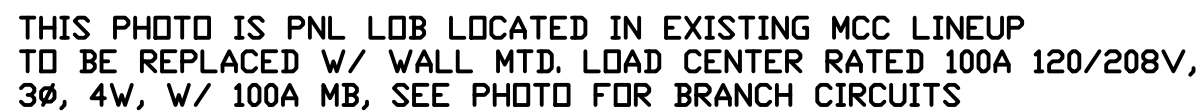
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MCC CONTROL DIAGRAMS
OCOE WWTF
ELECTRICAL UPGRADE AND
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ORANGE COUNTY, FL

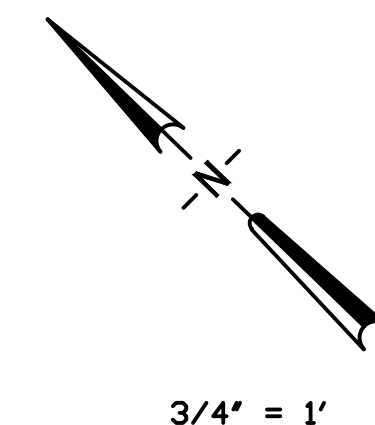
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E 09



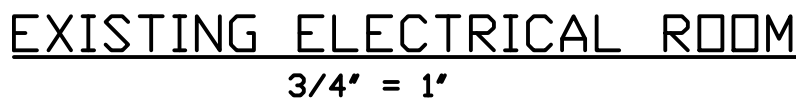
LOAD SERVED	AMPS ØA	BKR SIZE	POL	CKT NO.	ØA	ØB	CKT NO.	BKR SIZE	POL	AMPS ØA	ØB	LOAD SERVED
SPD	-	30	2	1			2	100	2	35	-	PNL A
SPD	-	30	2	3			4	100	2	35	-	PNL A
SPARE	-	20	1	5			6	20	1	-	-	SPARE
SPARE	-	20	1	7			8	20	1	-	-	SPARE
SPARE	-	20	1	9			10	20	1	-	-	SPARE
SPACE	-	20	1	11			12	20	1	-	-	SPACE
SPACE	-	20	1	13			14	20	1	-	-	SPACE
SPACE	-	20	1	15			16	20	1	-	-	SPACE
SPACE	-	20	1	17			18	20	1	-	-	SPACE
SPACE	-	20	1	19			20	20	1	-	-	SPACE
SPACE	-	20	1	21			22	20	1	-	-	SPACE
SPACE	-	20	1	23			24	20	1	-	-	SPACE
SPACE	-	20	1	25			26	20	1	-	-	SPACE
SPACE	-	20	1	27			28	20	1	-	-	SPACE
SPACE	-	20	1	29			30	20	1	-	-	SPACE
-	-				TOTAL ØA	AMPS THIS PANEL ØB				35	35	REMARKS:
TOTALS										TOTALS		

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E 12



- ① TO BE REMOVED & RELOCATED ON SITE
- ② REMOVE CONC. PAD PATCH TO MATCH EXISTING (SEE A SHTS)
- ③ TO REMAIN
- ④ TO BE REMOVED & DISPOSED
- ⑤ TO BE REPLACED
- ⑥ PROPOSED PNL LOB



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ELECTRICAL ROOM PLAN

OCOE WWTF

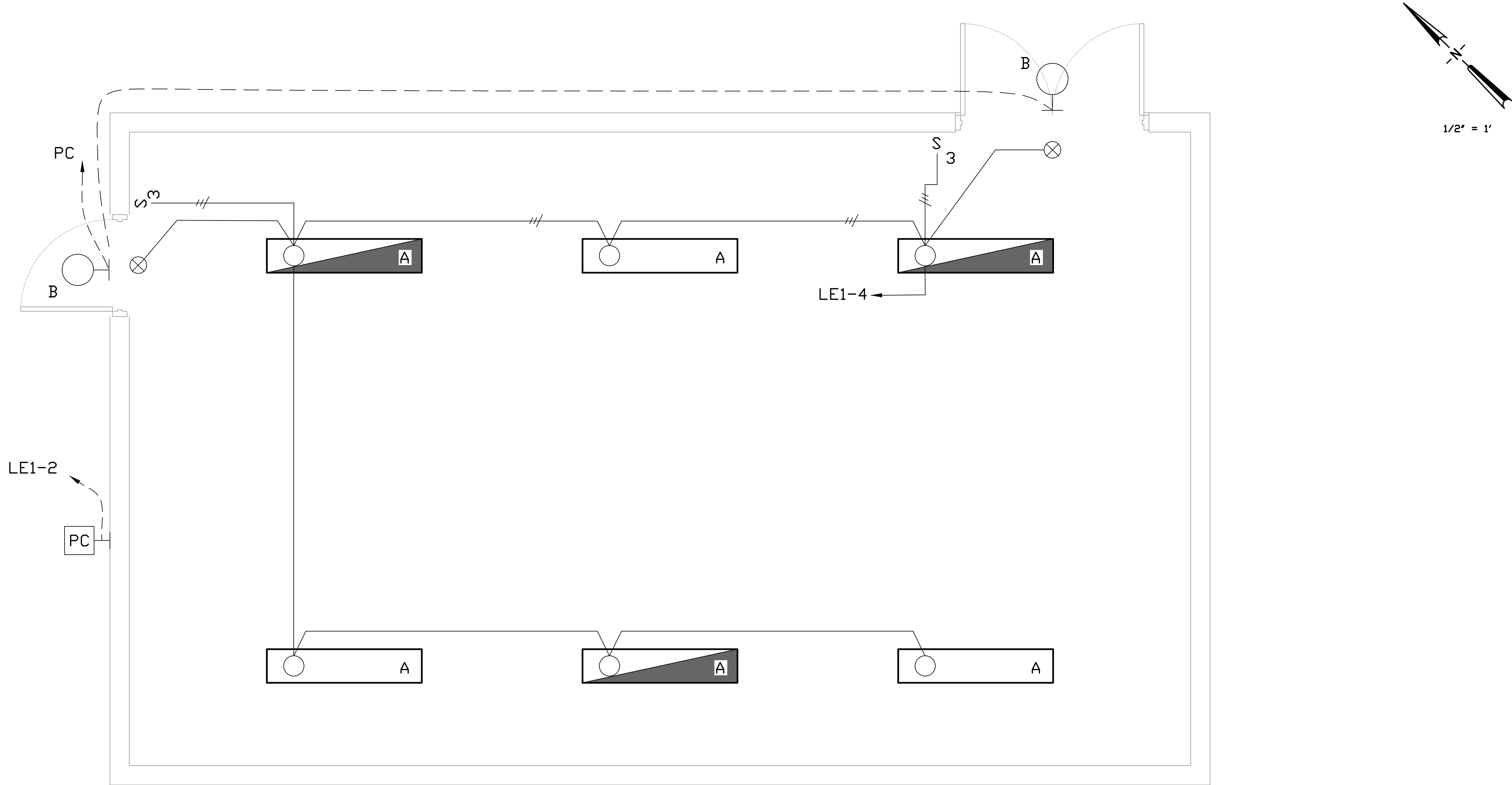
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ORANGE COUNTY, FL

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E 13

LIGHTING FIXTURE SCHEDULE			
MARK	WATT	DESCRIPTION	MFR (OR APPROVED EQUAL)
A	20	4' LED STATIC, 4000 LUMENS, WET LOCATION, FROSTED LENS, MEDIUM, 120V 4000K WITH BATTERY WHERE SHOWN ON PLANS	LITHONIA VAP LED
B	10	WALL MOUNTED LED, 4000K, TEXTURE FINISH, WET LOCATION, MVOLTS, SURFACE MOUNTED BRONZE	LITHONIA WSR WSR
⊗	5	LED EXIT LIGHT, 120VAC	LITHONIA TCE



ELECTRICAL BUILDING
LIGHTING PLAN
1/2" = 1'

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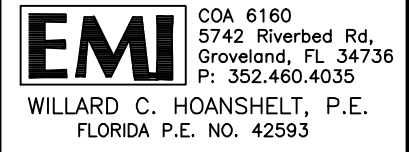
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Surveyor No. LB7143
Architect No. AA26000926
Landscape No. LC000298



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LICENSE
No. 42593
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PROFESSIONAL ENGINEER



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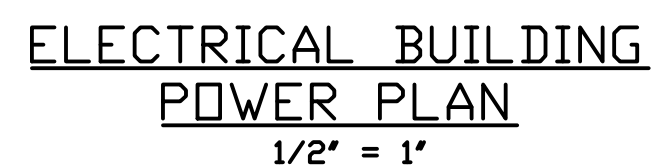
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ELECTRICAL BUILDING LIGHTING PLAN

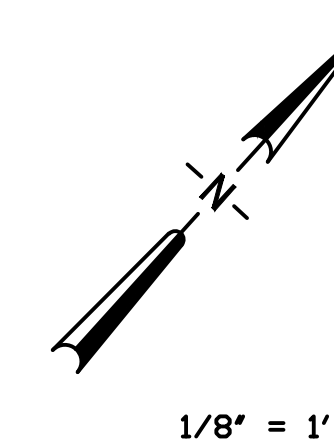
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$$1/2' = 1'$$

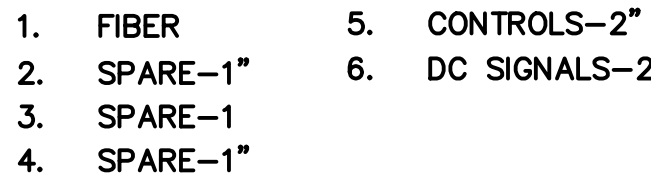
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Sheet No.
E 16



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|-----|----------------------|-----|------------------|-----|------------|
| 1. | ROTOR #1 | 25. | CLARIFIER #1 | 49. | SPARE-2" |
| 2. | ROTOR #2 | 26. | SCUM PS | 50. | SPARE-2" |
| 3. | ROTOR #3 | 27. | SLUDGE BLOWER #1 | 51. | SPARE-2" |
| 4. | ROTOR #4 | 28. | SLUDGE BLOWER #2 | 52. | SPARE-2" |
| 5. | ROTOR #5 | 29. | PNL A (OPS) | 53. | SPARE-2" |
| 6. | ROTOR #6 | 30. | PNL E (OPS) | 54. | SPARE-2" |
| 7. | DITCH WIER #1 | 31. | PNL LOB (OPS) | 55. | SPARE-2" |
| 8. | IN-PLANT PS | 32. | SLUDGE FEED CP | 56. | SPARE-2" |
| 9. | CLARIFIER #3 | 33. | MCC-NPW | 57. | SPARE-2" |
| 10. | SCUM PS | 34. | EP-1 | 58. | SPARE-2" |
| 11. | FILTER #1 | 35. | EP-2 | 59. | SPARE-2" |
| 12. | PNL B (PRETREATMENT) | 36. | EP-3 | 60. | SPARE-2" |
| 13. | PNL C (CHLORINE) | 37. | EP-4 | 61. | SPARE-2" |
| 14. | CLARIFIER #2 | 38. | MP-1 | 62. | SPARE-2" |
| 15. | RAS CP | 39. | MP-2 | 63. | SPARE-2" |
| 16. | DITCH WEIR #2 | 40. | MP-3 | 64. | SPARE-2" |
| 17. | NPW PS | 41. | MP-4 | 65. | SPARE-2" |
| 18. | PRESS WASH PNL | 42. | SPARE-3" | 66. | SPARE-2" |
| 19. | PNL F (SLUDGE DEWTR) | 43. | SPARE-3" | 67. | SPARE-2" |
| 20. | FILTER #2 | 44. | SPARE-3" | 68. | SPARE-1" |
| 21. | MIXER #1 | 45. | SPARE-3" | 69. | SPARE-1" |
| 22. | MIXER #2 | 46. | SPARE-2" | 70. | SPARE-1" |
| 23. | MIXER #3 | 47. | SPARE-2" | 71. | SPARE-1" |
| 24. | MIXER #4 | 48. | SPARE-2" | 72. | METAL BLDG |

- | | | |
|--------------------------|--------------------------|------------------|
| 1. ROTOR #1 | 13. PNL C (CHLORINE) | 25. CLARIFIER #1 |
| 2. ROTOR #2 | 14. CLARIFIER #2 | 26. SCUM PS |
| 3. ROTOR #3 | 15. RAS CP | 27. SPARE-2" |
| 4. ROTOR #4 | 16. DITCH WEIR #2 | 28. SPARE-2" |
| 5. ROTOR #5 | 17. NPW PS | 29. SPARE-2" |
| 6. ROTOR #6 | 18. PRESS WASH PNL | 30. SPARE-2" |
| 7. DITCH WIER #1 | 19. PNL F (SLUDGE DEWTR) | 31. SPARE-2" |
| 8. IN-PLANT PS | 20. FILTER #2 | 32. SPARE-2" |
| 9. CLARIFIER #3 | 21. MIXER #1 | 33. METAL BLDG |
| 10. SCUM PS | 22. MIXER #2 | |
| 11. FILTER #1 | 23. MIXER #3 | |
| 12. PNL B (PRETREATMENT) | 24. MIXER #4 | |

- | | | | | |
|------------|----------------------|--------------|--------------|----------------|
| 1. MCC-NPW | 9. MP-4 | 17. SPARE-2" | 25. GB | 33. CONTROL-1" |
| 2. EP-1 | 10. SPARE-2" | 18. SPARE-2" | 26. GB | 34. PNL LG |
| 3. EP-2 | 11. SLUDGE FEED CP | 19. SPARE-2" | 27. GB | 35. SPARE-4" |
| 4. EP-3 | 12. SLUDGE BLOWER #1 | 20. SPARE-2" | 28. GB | 36. FIBER |
| 5. EP-4 | 13. SLUDGE BLOWER #2 | 21. SPARE-2" | 29. SPARE-2" | |
| 6. MP-1 | 14. CONTROLS-2" | 22. SPARE-2" | 30. PNL A | |
| 7. MP-2 | 15. SPARE-2" | 23. SPARE-2" | 31. PNL E | |
| 8. MP-3 | 16. SPARE-2" | 24. SPARE-2" | 32. PNL LOB | |

1. CONDUITS SHALL BE CONCRETE ENCASED UNDER GRASSY AREAS ONLY

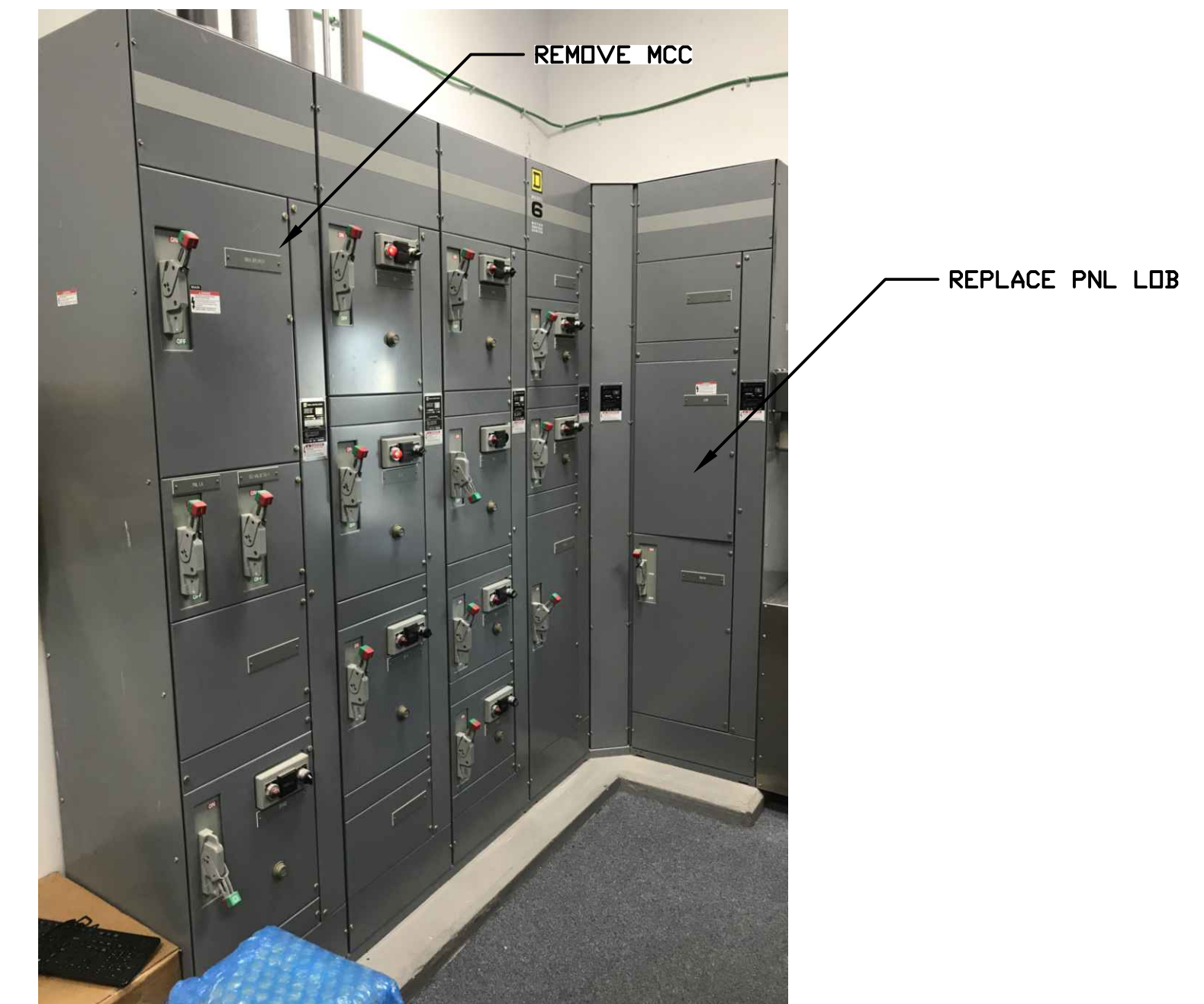
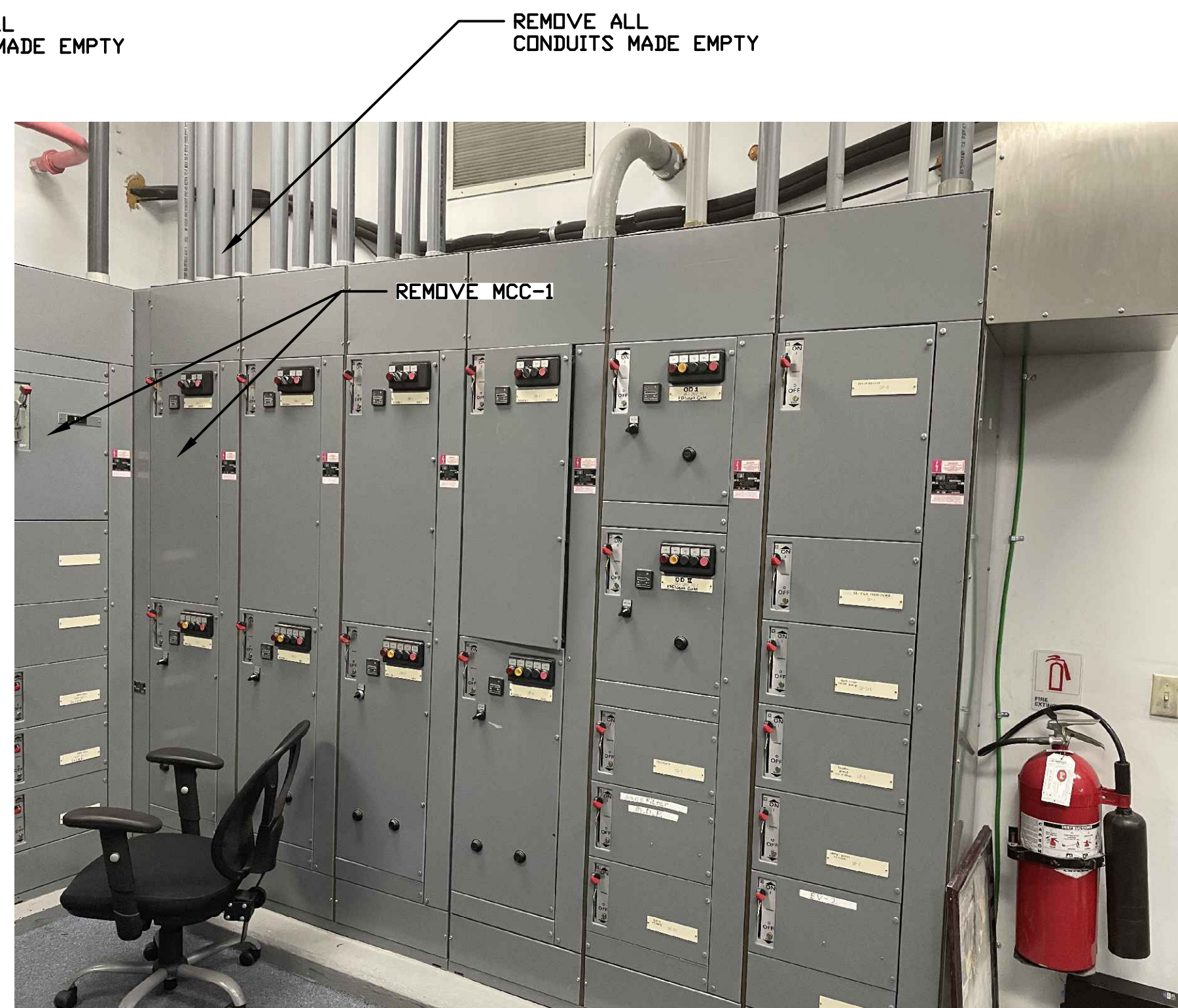
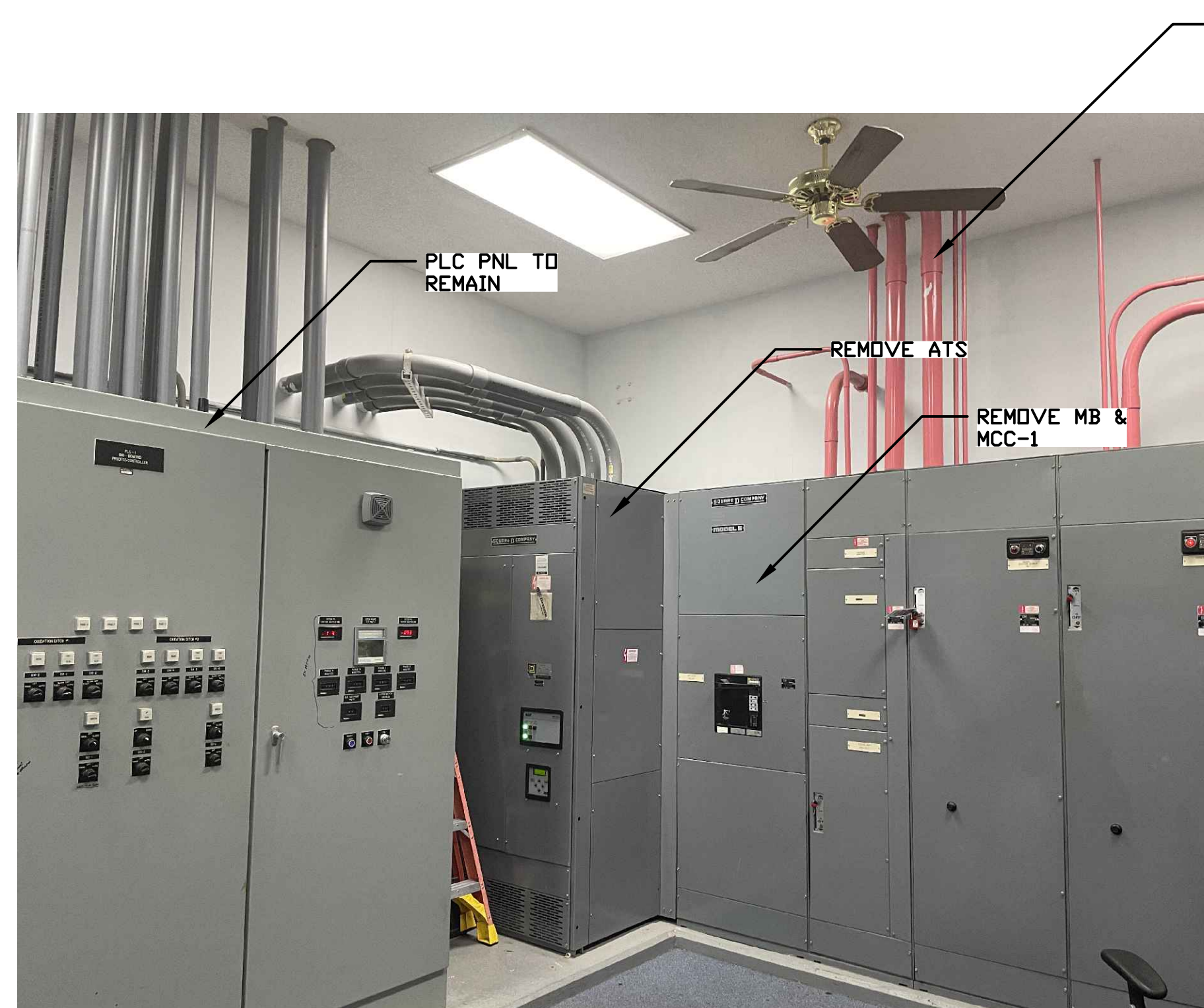
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|------------|----------------------|--------------|
| 1. MCC-NPW | 9. MP-4 | 17. SPARE-2" |
| 2. EP-1 | 10. SPARE-2" | 18. SPARE-2" |
| 3. EP-2 | 11. SLUDGE FEED CP | 19. SPARE-2" |
| 4. EP-3 | 12. SLUDGE BLOWER #1 | 20. SPARE-2" |
| 5. EP-4 | 13. SLUDGE BLOWER #2 | 21. SPARE-2" |
| 6. MP-1 | 14. CONTROLS-2" | 22. SPARE-2" |
| 7. MP-2 | 15. SPARE-2" | 23. SPARE-2" |
| 8. MP-3 | 16. SPARE-2" | 24. SPARE-2" |

1. FIBER
2. PNL A
3. PNL E
4. PNL LOB

- | | |
|-------|---------------|
| 1. GB | 5. CONTROL-1" |
| 2. GB | 6. PNL LG |
| 3. GB | 7. SPARE-4" |
| 4. GB | 8. SPARE-1" |

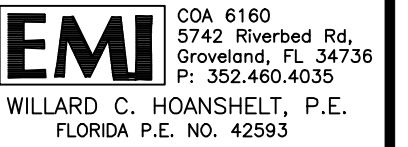
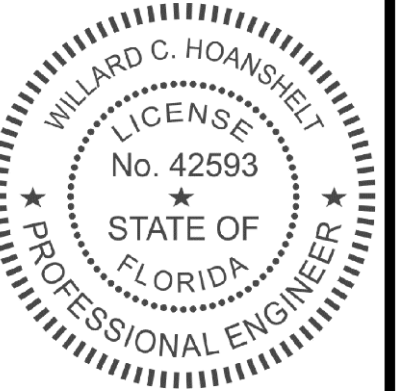
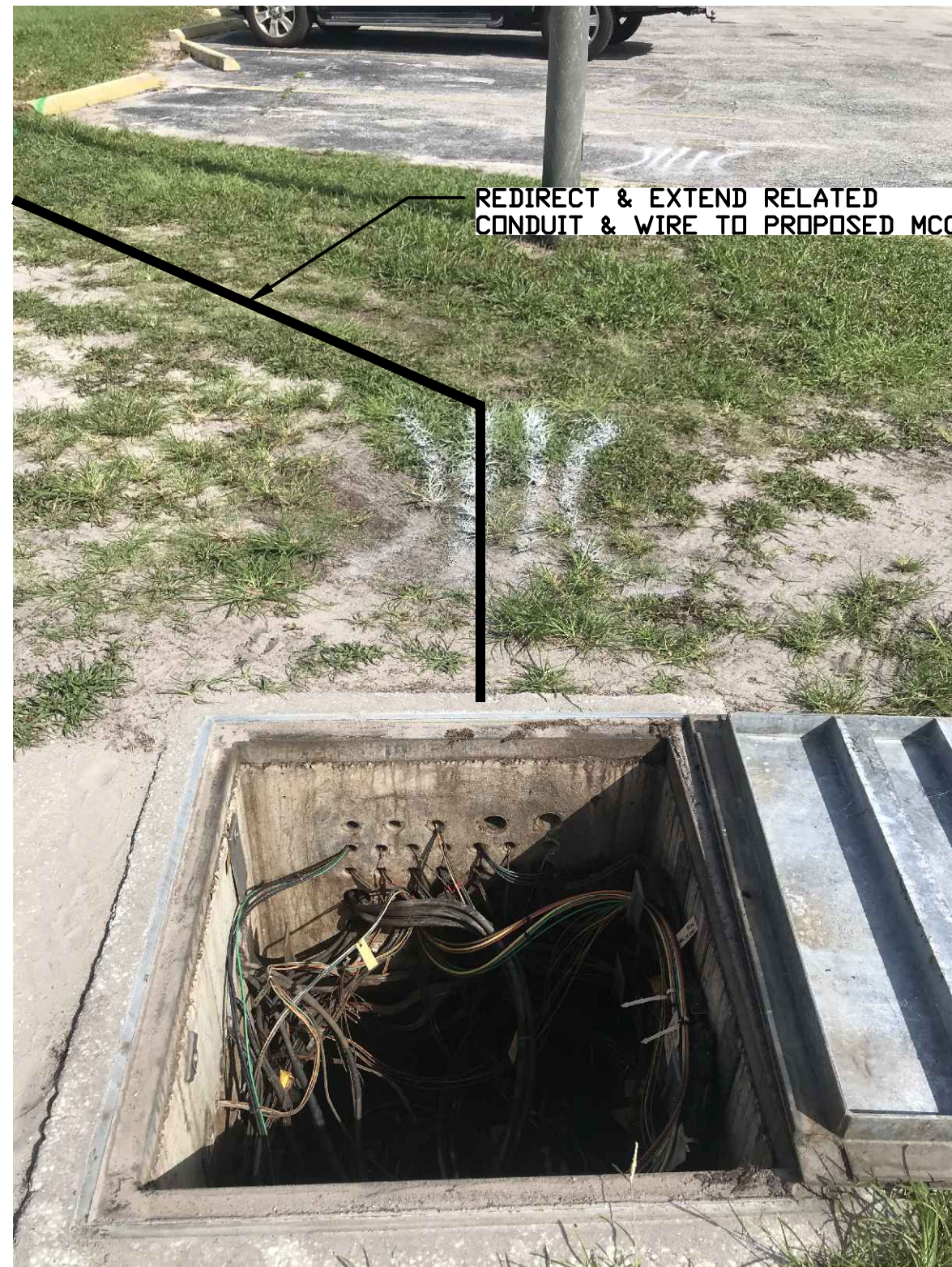
1. SLUDGE BLOWER #1
2. SLUDGE BLOWER #2
3. SLUDGE FEED CP
4. CONTROLS-1"

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△	Date	Revision
No.		

Designed: W.C.H.	
Drawn: J.P.H.	
Checked: W.C.H.	
Job No.: E12345	
Date: 6/6/22	© 2023

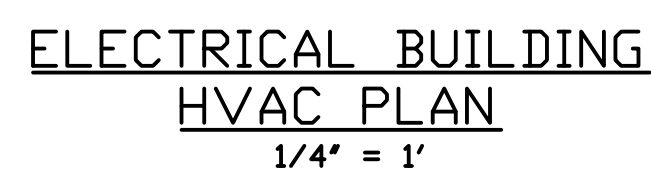
PROJECT PHOTOS

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Sheet No.
E 19



- ## PAC ACCESSORIES
1. LOW AMBIENT CONTROL
 2. MC4000 CONTROLLER
 3. ANTI-SHORT CYCLE
 4. FRESH DAMPER
 5. FACTORY T-STAT
 6. CONDENSER COIL COATING
 7. STAINLESS STEEL HOUSING
 8. ALUM. AIR SUPPLY & RETURN GRILLES

AIR COOLED PACKAGED WALL MOUNTED A/C UNITS																							
ITEM NO.	NO. REQ'D	AREA SERVED	SYSTEM CAPACITY		INDOOR FAN			CONDENSER			COMPRESSOR		ELECTRICAL			FILTERS		HEAT KW	CABINET MAT'L	COATING COIL	ACCESSORIES	BARD MODEL NO.	
			TONS	EER	CFM	WG	Ø/A	ØSA F	CFM	REF. WT.	NO.	TYPE	MCCP	VOLT	PHASE	QUA.	SIZE						
PAC-E1	1	MAIN ELECTRICAL BLDG	3.5	11.0	1350	.2	0	95	3000	410A	490	1	SCROLL	14	208	1Ø	2	20X20X1	0	STAINLESS STEEL	CONDENSER	1,3,5,6,7,8	W42AC-CA-00-B-X-S-E
PAC-E2	1	MAIN ELECTRICAL BLDG	3.5	11.0	1350	.2	0	95	3000	410A	490	1	SCROLL	14	208	1Ø	2	20X20X1	0	STAINLESS STEEL	CONDENSER	1,3,5,6,7,8	W42AC-CA-00-B-X-S-E

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ELECTRICAL BUILDING LIGHTING PLAN

OCOEE WWTF

**ELECTRICAL UPGRADE AND
EXPANSION**

ORANGE COUNTY, FL

THIS SHEET NOT VALID FOR
CONSTRUCTION WITHOUT
COMPLETE SET OF PLANS

Sheet No.
H 1

STAFF REPORT

Meeting Date: May 21, 2024
Item #: 7

Contact Name: Stephen Krug
Contact Number: Ext. 6002

Department Director: Stephen Krug
City Manager: Robert Frank

Subject: Approval of 2023-2024 Capital Improvement Project with Superior Sheds. (Public Works Director Krug)

Background Summary:

The approved budget for 2023/2024 includes a capital project for the construction of a prefabricated covered metal shed at the Public Works complex. The structure would be used to protect the department's heavy equipment from the elements. Public Works solicited pricing from Superior Sheds, our sole/single source vendor for prefabricated sheds, to keep uniformity with the department's other similar existing structures. Public Works reviewed the proposal and found the cost to be in line with current industry standards. Public Works is requesting Commission approval to award the work to Superior Sheds, at their proposal cost of \$55,067.20.

Public Works recommends issuing a purchase order to Superior Sheds in the amount of \$55,067.20, which is adequately funded in the budget.

Issue:

Should the Honorable Mayor and City Commissioners approve issuing a purchase order to Superior Sheds for the construction of a prefabricated covered metal shed at 301 Maguire Rd.?

Recommendations:

Staff recommends the Honorable Mayor and City Commissioners approve issuing a purchase order to Superior Sheds in the amount of \$55,067.20, and authorize the City Manager and staff to approve and execute change orders to the work in accordance with the limits established in the Purchasing Code.

Attachments:

1. Superior Shed Proposal
2. Pole Barn - Engineering
3. Location

Financial Impacts:

The cost of the shed is adequately funded in the 2023/2024 Streets Division Capital Program for Public Works.

Type of Item: Consent



2323 S. Volusia Avenue
Orange City, Florida 32763
877-439-7433

2-12-24

To: Craig Smith
City of Ocoee
407-905-3100 ext. 6015

30' x 100' x 20' carport = \$46,935 plus proof of tax exemption.
The roof will be vertical. The wind rating will be at the 150mph code.
The carport will have five 15' x 15' frame outs on one 100' side.

Non-refundable site-specific engineering is at a cost of \$650.
The nonrefundable site visit is at a cost of \$150.
The additional mileage fee = \$100.
The installation fee = \$4732.20.
The cost to rent a lull – telescopic list is \$2500.

The grand total = \$55,067.20.

Purchase orders are accepted.

The Customer is required to provide level land or a level foundation. Steel does not come with a floor.

Purchase may be made over the phone using a credit card.
Purchase orders need to be approved by the Manager of the steel division.

Give me a call if you have any question or are ready to place an order.

Connie Sibila

Corporate Office / Internet Sales Specialist
386-951-0224



SITE INSTALLED NOTES
NOTE: THAT THIS LIST DOES NOT NECESSARILY LIMITS THE ITEMS OF WORK AND MATERIALS THAT MAY BE REQUIRED FOR A COMPLETE INSTALLATION. ALL SITE RELATED ITEMS ARE RELATED ITEMS ARE SUBJECT TO LOCAL JURISDICTION AND APPROVAL. 1. THE COMPLETE FOUNDATION SUPPORT AND TIE DOWN SYSTEM. 2. RAMPS, STAIRS AND GENERAL ACCESS TO THE BUILDING. 3. PORTABLE FIRE EXTINGUISHER(S). 4. DRINKING FOUNTAIN, BUILDING DRAINS, CLEAN-OUTS, AND HOOK-UP TO PLUMBING SYSTEM. 5. ELECTRICAL SERVICE HOOK-UP (INCLUDING FEEDERS) TO THE BUILDING. 6. THE MAIN ELECTRICAL PANEL AND SUB-FEEDERS (MULTI-UNITS ONLY). 7. CONNECTION OF ELECTRICAL CIRCUITS CROSSING OVER MODULE MATING LINE(S) - (MULTI-UNITS ONLY). 8. STRUCTURAL AND AESTHETIC INTERCONNECTIONS BETWEEN 9. WINDOW AND DOOR HIGH WIND STORM COVERINGS PER CODE. 10. GUTTERS AND DOWNSPOUTS (IF APPLICABLE). 11. SINK AND CABINETS. 12. FIRE ALARM SYSTEM, WIRING, ETC (IF APPLICABLE). 13. THERMAL EXPANSION DEVICE (IF REQUIRED). 14. WINDOW AND DOOR HIGH WIND STORM COVERINGS PER CODE TO BE SUPPLIED AND SITE INSTALLED BY OTHERS SUBJECT TO LOCAL JURISDICTION AND APPROVAL. 15. PLAN REVIEW AND INSPECTION REQUIRED BY CHAPTER 633 F.S. TO BE DONE BY THE LOCAL FIRE SAFETY INSPECTOR.
ELEVATION NOTES
1. SEE CROSS SECTION FOR METHOD OF ROOF VENTILATION 2. HANDICAP RAMP(S), STAIRS, AND HANDRAILS ARE TO BE DESIGNED AND SITE INSTALLED BY OTHERS, SUBJECT TO LOCAL JURISDICTION AND APPROVAL. 3. FOUNDATION ENCLOSURE (WHEN PROVIDED) MUST HAVE 1 SQUARE FOOT NET VENT AREA PER 111 1/150TH OF THE FLOOR AREA, AND AN 18" X 24" MINIMUM CRAWL SPACE ACCESS, SITE INSTALLED BY OTHERS, SUBJECT TO LOCAL JURISDICTION AND APPROVAL.
GENERAL NOTES
1. ACCESS TO BUILDING FOR PERSONS IN WHEELCHAIRS IS DESIGNED BY AND FIELD BUILT BY OTHERS AND SUBJECT TO ALL LOCAL JURISDICTIONS. AT LEAST 50% OF PUBLIC ENTRANCES (INCLUDING PRIMARY ENTRANCE) AND ALL REQUIRED EXITS MUST BE ACCESSIBLE. 2. ALL DOORS SHALL BE OPERABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY, TOOL, SPECIAL KNOWLEDGE OR EFFORT. MANUALLY OPERATED FLUSH BOLTS OR SURFACE BLOTS SHALL NOT BE USED. 3. ALL GLAZING WITHIN A 48 INCH ARC OF DOORS, WHOSE BOTTOM EDGE IS LESS THAN 60 INCHES ABOVE THE FLOOR, AND ALL GLAZING IN DOORS SHALL BE SAFETY, TEMPERED OR ACRYLIC PLASTIC SHEET. 4. ALL STEEL STRAPS REFERENCED ON FLOOR PLAN SHALL BE 1.5 INCH X 26 GA. W/ (8) 15 GA. X 7/16 INCH CROWN X 1 1/2 INCH STAPLES WITH A MINIMUM OF 1" PENETRATION EACH END OF STRAP. 5. MIN. CORRIDOR WIDTH IS 44 INCHES. 6. MIN. CORRIDOR FINISH IS CLASS B (GYPSUM). 7. IN WIND BORNE DEBRIS REGIONS, EXTERIOR GLAZING SHALL BE PROTECTED WITH AND IMPACT RESISTANT COVERING OR WITH MINIMUM 7/16" WOOD STRUCTURAL PANELS PER SECTION 1609.1.2 OF THE FBC. PANELS SHALL BE PRECUT TO COVER THE GLAZED OPENINGS WITH ATTACHMENT HARDWARE PROVIDED PER TABLE 1609.1.2 THE IMPACT RESISTANT COVERING OR WOOD STRUCTURAL PANELS ARE TO BE PROVIDED ON SITE BY OTHERS. SUBJECT TO LOCAL JURISDICTION AND APPROVAL. WIND BORNE DEBRIS REGIONS ARE AREAS WITHIN ONE MILE OF THE COASTAL MEAN HIGH WATER LINE. WHERE THE ULTIMATE DESIGN WIND SPEED IS 130 MPH OR GREATER AND AREAS WHERE THE ULTIMATE DESIGN WIND SPEED IS 140 MPH OR GREATER 8. EMERGENCY LIGHTING SHALL BE CAPABLE OF PROVIDING INITIAL ILLUMINATION THAT IS AT LEAST AN AVERAGE OF 1 FOOT-CANDLE AND A MIN. OF .1 FC MEASURED ALONG THE EGRESS AT THE FLOOR LEVEL. ILLUMINATION LEVELS SHALL BE PERMITTED TO DECLINE TO .6 C AVERAGE AND A MINIMUM AT ANY POINT OF .06 FC AT THE END OF THE EMERGENCY LIGHT TIME DURATION. A MAXIMUM-TO-MINIMUM ILLUMINATION UNIFORMITY RATIO OF 40 TO 1 SHALL NOT BE EXCEEDED. THE EMERGENCY POWER SYSTEM SHALL PROVIDE POWER FOR A DURATION OF NOT LESS THAN 90 MINUTES.

FLORIDA PRODUCT APPROVAL CHART			
APPROVAL #	MANUFACTURER	VALIDATED BY	STATUS
FL1763-R4	ADVANCED ALUMINUM CATEGORY: ROOFING SUBCATEGORY: METAL ROOFING	BRIAN JAKS, P.E. (281) 468-0699	APPROVED
FL23138-R1	ADVANCED ALUMINUM CATEGORY: STRUCTURAL COMPONENTS SUBCATEGORY: STRUCTURAL WALL	BRIAN JAKS, P.E. (281) 468-0699	APPROVED
FL23139-R1	ADVANCED ALUMINUM CATEGORY: STRUCTURAL COMPONENTS SUBCATEGORY: ROOF DECK	BRIAN JAKS, P.E. (281) 468-0699	APPROVED
FL30315-R2	ADVANCED ALUMINUM CATEGORY: ROOFING SUBCATEGORY: METAL ROOFING	MICHAEL JOHN RIEMER, P.E. (561) 414-7557	APPROVED
FL31736-R1	ADVANCED ALUMINUM CATEGORY: STRUCTURAL COMPONENTS SUBCATEGORY: ROOF DECK	MICHAEL JOHN RIEMER, P.E. (561) 414-7557	APPROVED
FL31737-R1	ADVANCED ALUMINUM CATEGORY: STRUCTURAL COMPONENTS SUBCATEGORY: STRUCTURAL WALL	MICHAEL JOHN RIEMER, P.E. (561) 414-7557	APPROVED
FL32151-R1	ADVANCED ALUMINUM CATEGORY: STRUCTURAL COMPONENTS SUBCATEGORY: ROOF DECK	MICHAEL JOHN RIEMER, P.E. (561) 414-7557	APPROVED
FL32152-R1	ADVANCED ALUMINUM CATEGORY: STRUCTURAL COMPONENTS SUBCATEGORY: STRUCTURAL WALL	MICHAEL JOHN RIEMER, P.E. (561) 414-7557	APPROVED
FL33569-R1	ADVANCED ALUMINUM CATEGORY: ROOFING SUBCATEGORY: METAL ROOFING	MICHAEL JOHN RIEMER, P.E. (561) 414-7557	APPROVED
FL17996.5	ELIXIR DOOR AND METAL COMPANY MODEL #: SERIES 407		APPROVED
FL21450-R6	JANUS INTERNATIONAL GROUP LLC. MODEL #: 850		APPROVED

STRUCTURAL LOAD LIMITATIONS
WIND LOAD CRITERIA 1. 136 VuIt 2. I 3. I 4. OPEN 5. GCpf = 0.18 6. C 7. 0.85 8. 0.85 9. Pr = -93.0 PSF WIND SPEED (MPH) RISK CATEGORY BUILDING CATEGORY ENCLOSURE CLASSIFICATION INTERNAL PRESSURE COEFFICIENT EXPOSURE FACTOR WIND DIRECTIONALITY FACTOR (Kd) GUST RESPONSE FACTOR (Gh) MAIN FRAME STRUCTURE OVERTURNING LOAD

10. COMPONENT & CLADDING LOAD

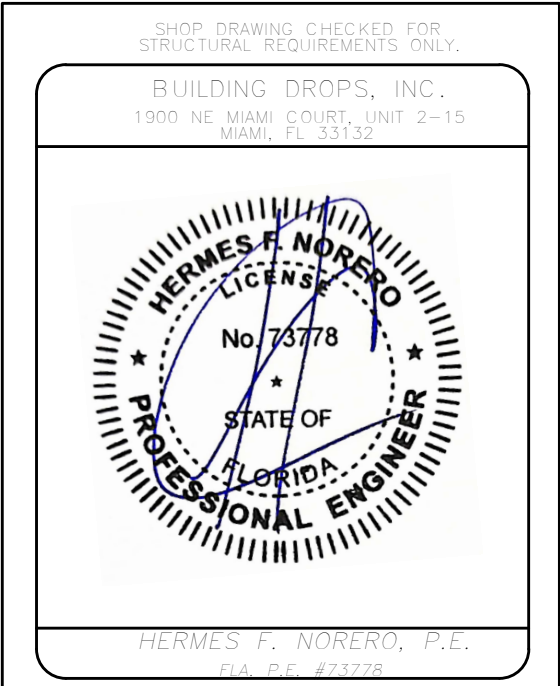
(ROOF)

Pr = ZONE 1: -29.82 PSF, ZONE 2: -42.26 PSF, ZONE 3: -59.64 PSF

(WALL)

PW = ZONE 4: +26.52 / -28.74 PSF, ZONE 5: +26.52 / -35.46 PSF

Digitally signed by Hermes F. Norero, P.E.
Reason: I am approving this document
Date: 2024.04.30 15:18:38 -04'00'



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ON THE DATE AND/OR TIME STAMP SHOWN USING A DIGITAL SIGNATURE.
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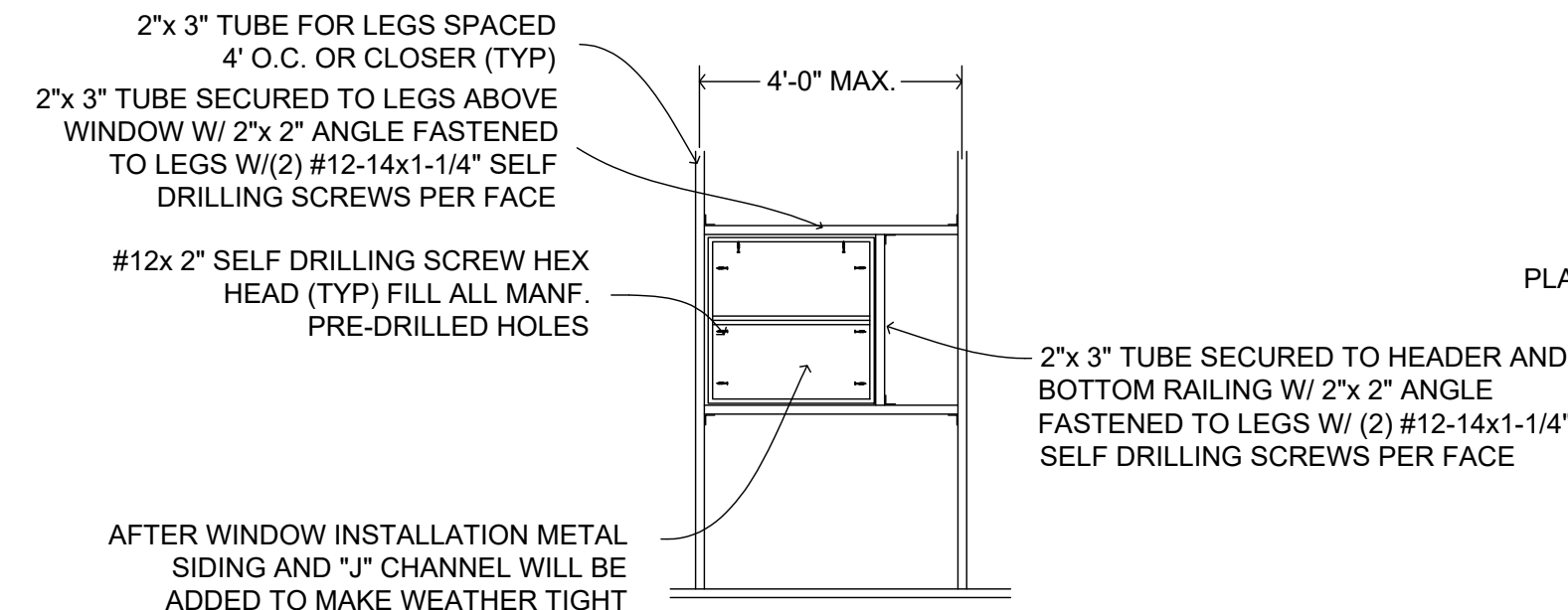
SUPERIOR SHEDS, INC.
2323 S. VOLUSIA AVE.
ORANGE CITY, FL 32763
OFFICE: 813.996.7431
www.superiorsheds.com



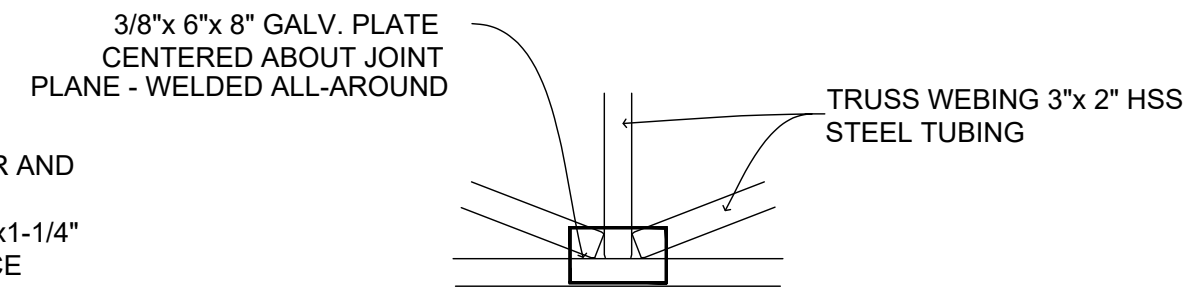
PUBLIC WORKS FACILITY
301 MAGUIRE ROAD
OCOOEE, FL 34761

TITLE:
DATE
DRAWN E.ROM
JOB SUP108
SHEET NO.

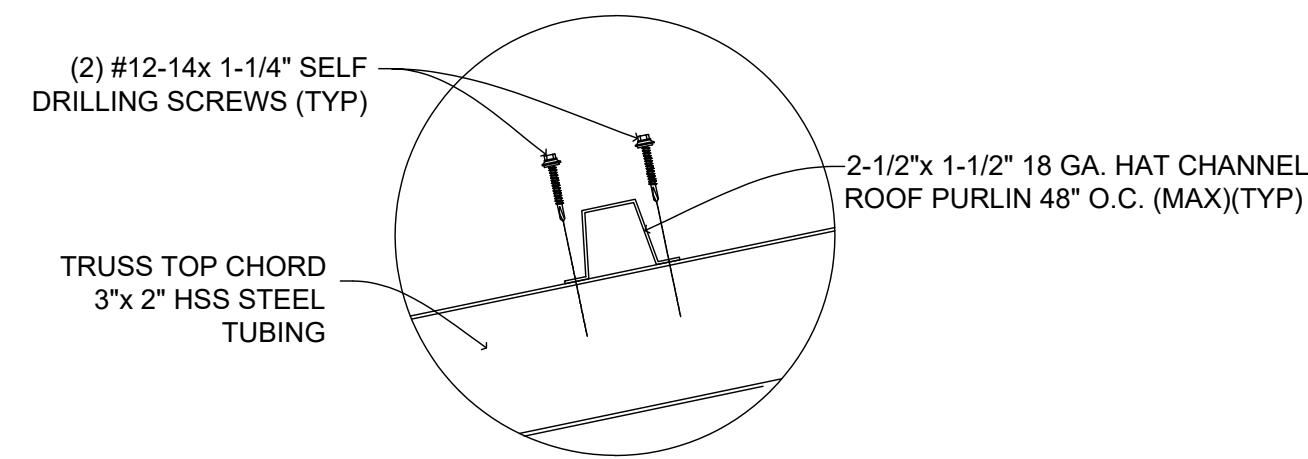
C1



WINDOW INSTALLATION DETAIL
N.T.S.

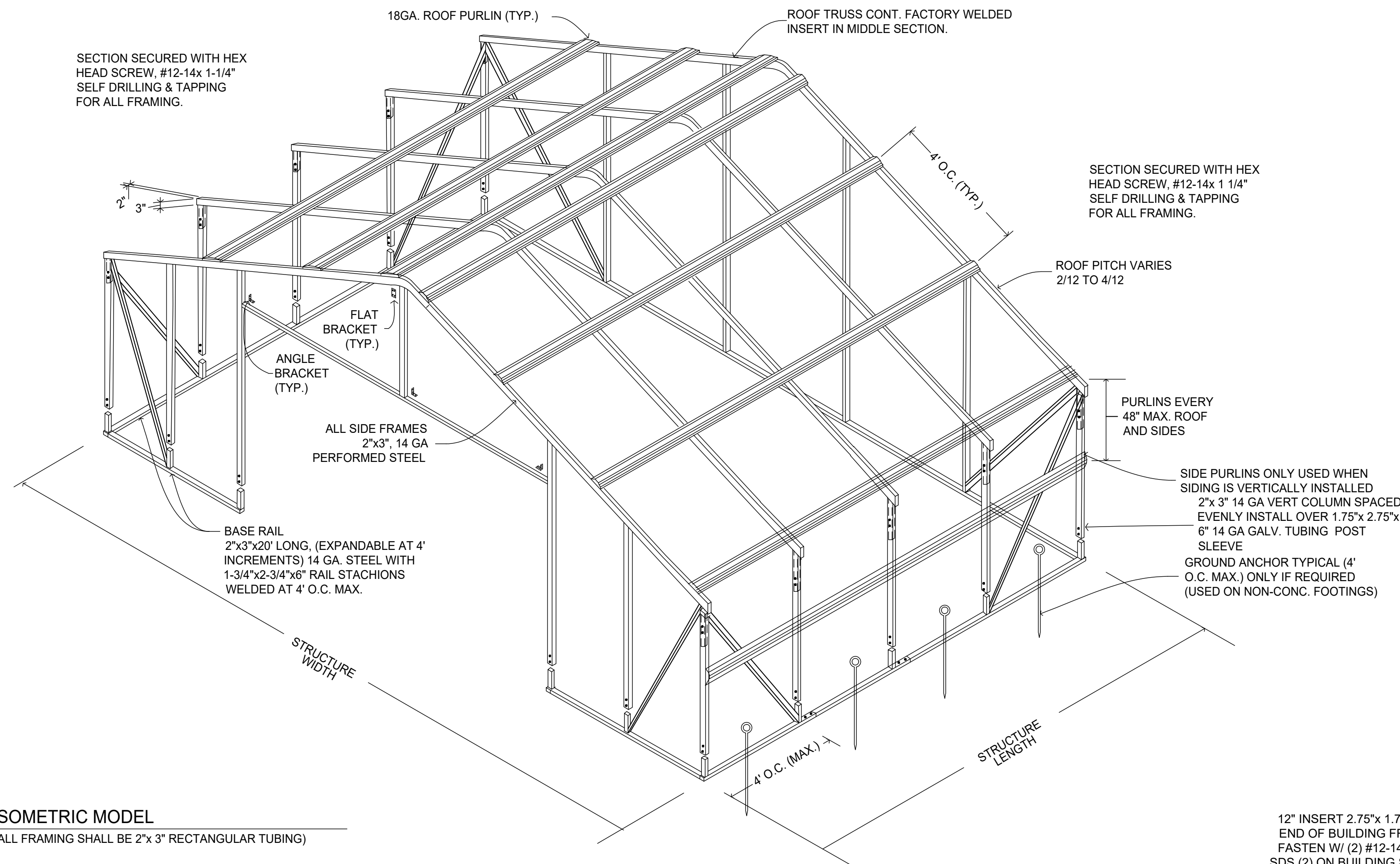


TYPICAL TRUSS CONNECTIONS



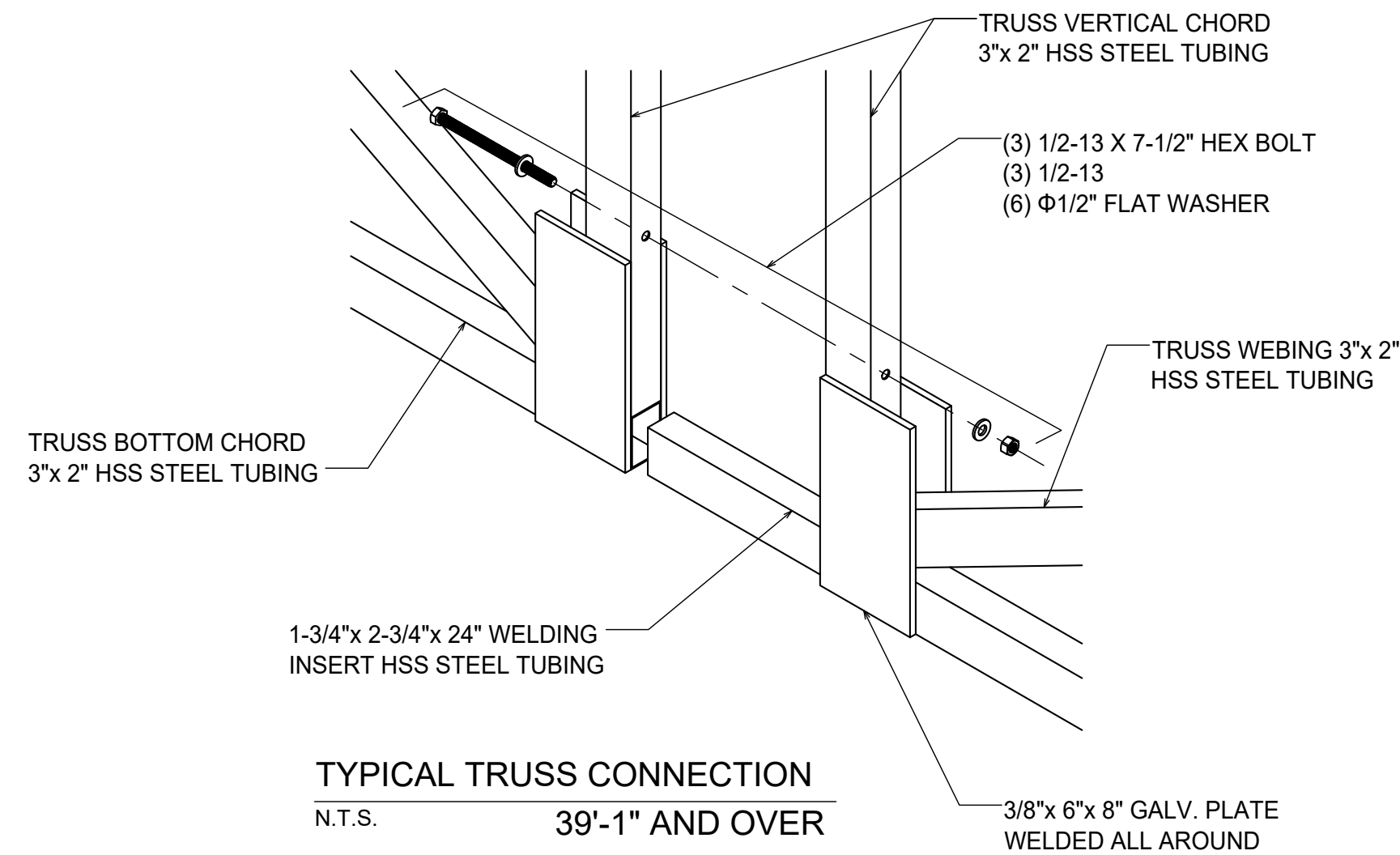
TYPICAL ROOF PURLIN ATTACHMENT

SECTION SECURED WITH HEX
HEAD SCREW, #12-14x 1-1/4"
SELF DRILLING & TAPPING
FOR ALL FRAMING.



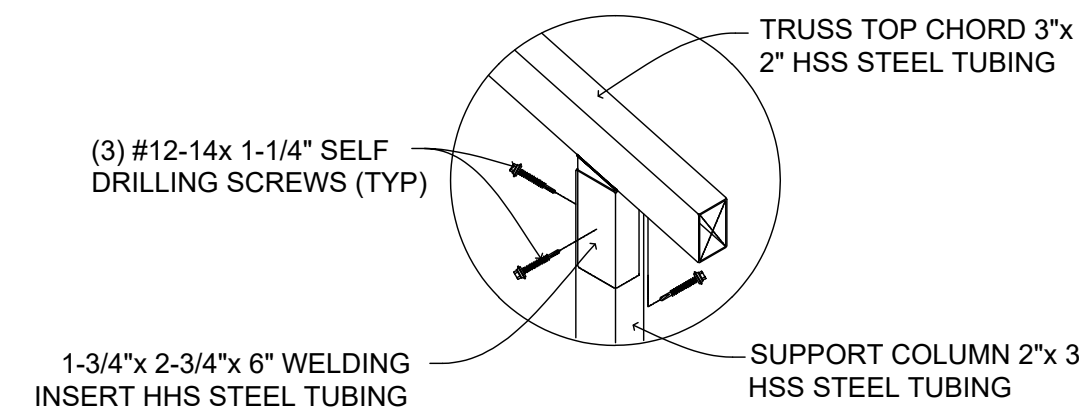
ISOMETRIC MODEL

(ALL FRAMING SHALL BE 2"x 3" RECTANGULAR TUBING)

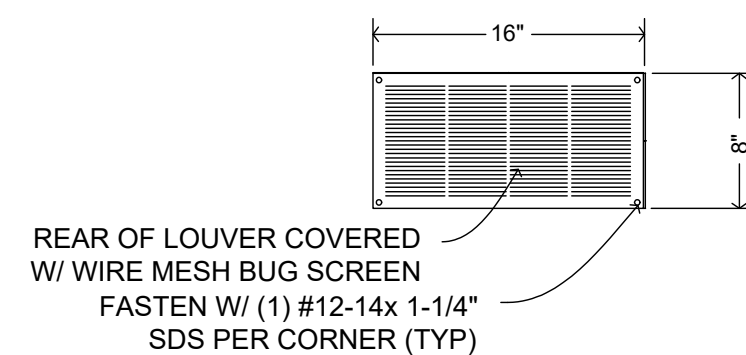


TYPICAL TRUSS CONNECTION

N.T.S. 39'-1" AND OVER



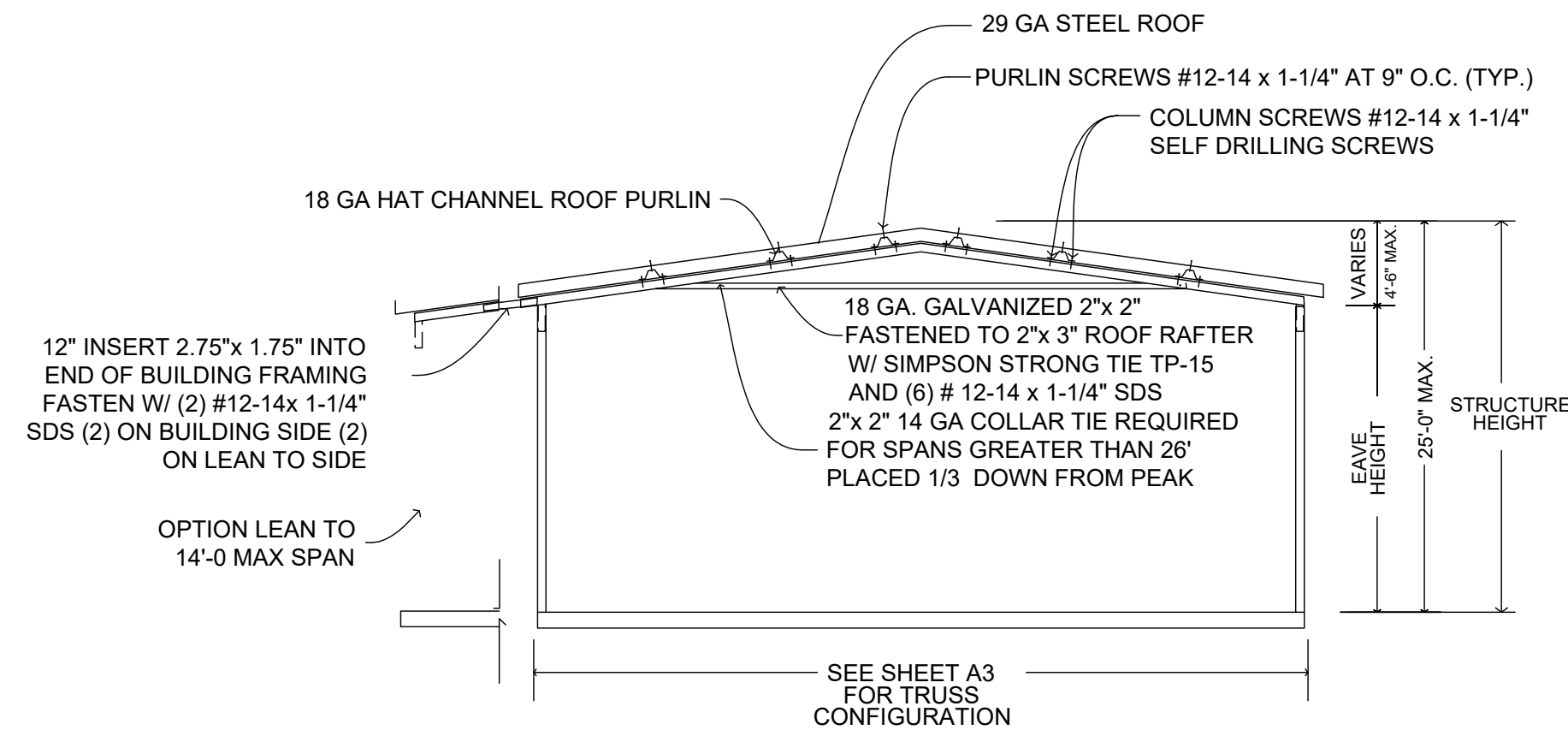
TYPICAL BOXED EAVE CONNECTION



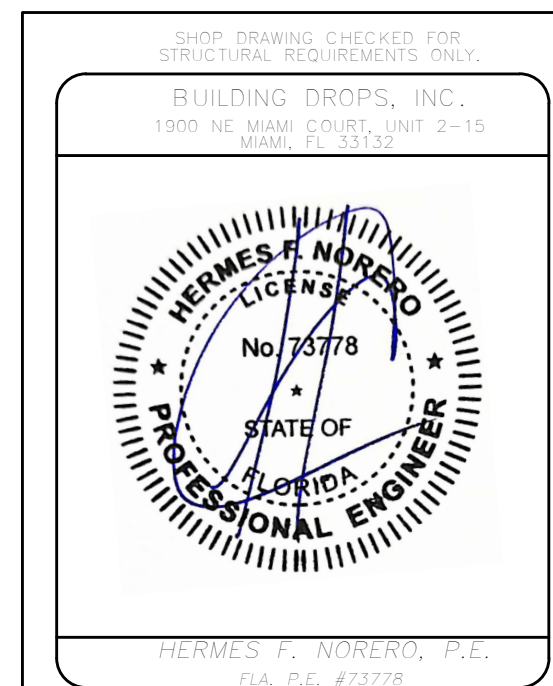
CODE REQUIREMENT 1 IN² PER FT² OF ENCLOSED BUILDING
TOTAL ENCLOSED BUILDING = 600 FT²
EQUIVALENT FLOOD OPENING = 192 IN² EA.
(25% REDUCTION DUE TO FINS) = 144 IN² EA.
TOTAL PROVIDED (5) = 720 IN²

FLOOR OPENING DETAIL (ONLY USED
WHEN FINISH FLOOR IS BELOW BFE)

N.T.S.



COLLAR TIE DETAIL AND POST BRACING DETAIL
N.T.S.
NOTE: SEE SHEET A4 FOR ANCHORING DETAILS
(NOTE: ALL FRAMING SHALL BE 2"x 3" RECTANGULAR TUBING)
(NOTE: WHEN OVER 26' IN WIDTH USE COLLAR TIE DETAIL
OR TRUSS DESIGN STYLE)



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37

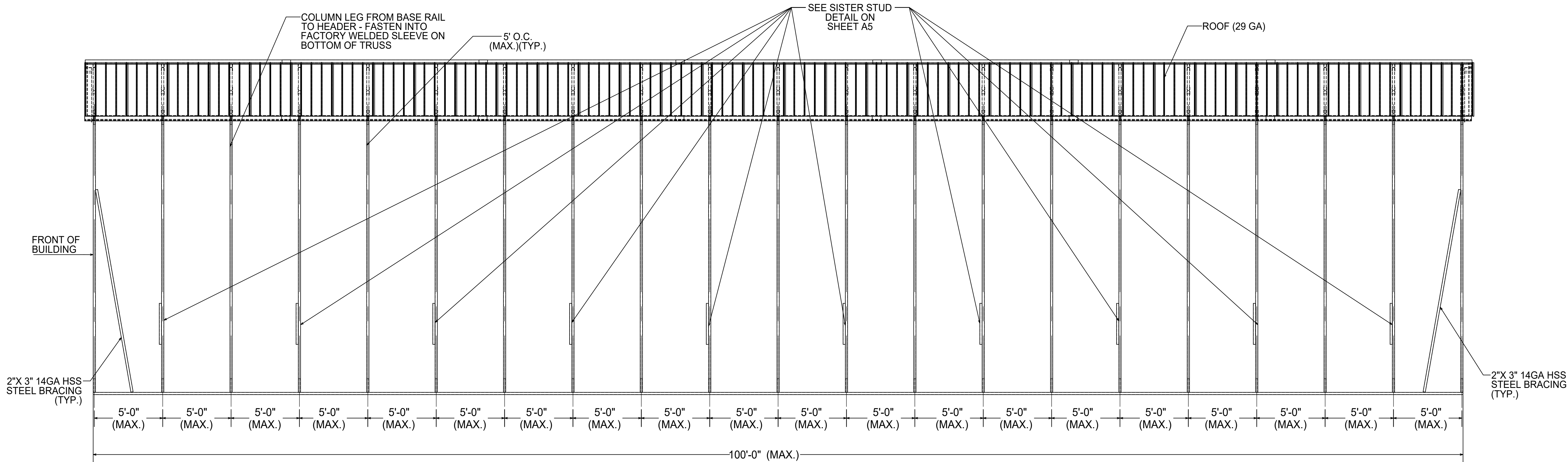
DATE _____

DRAWN E.ROM

JOB	SUP108
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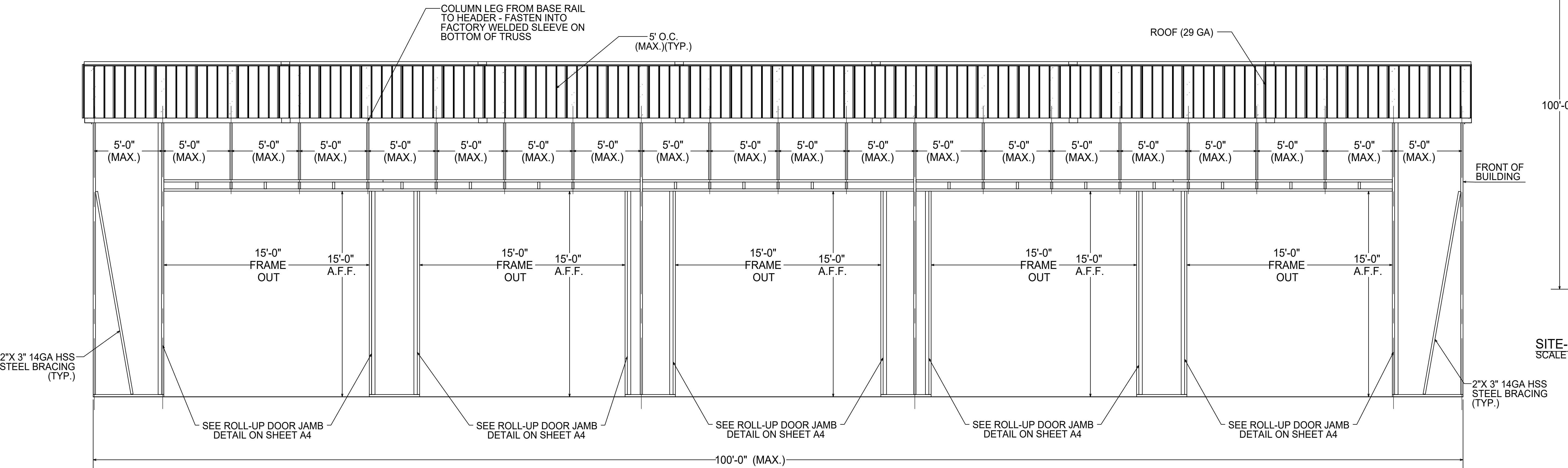
SHEET NO

A1



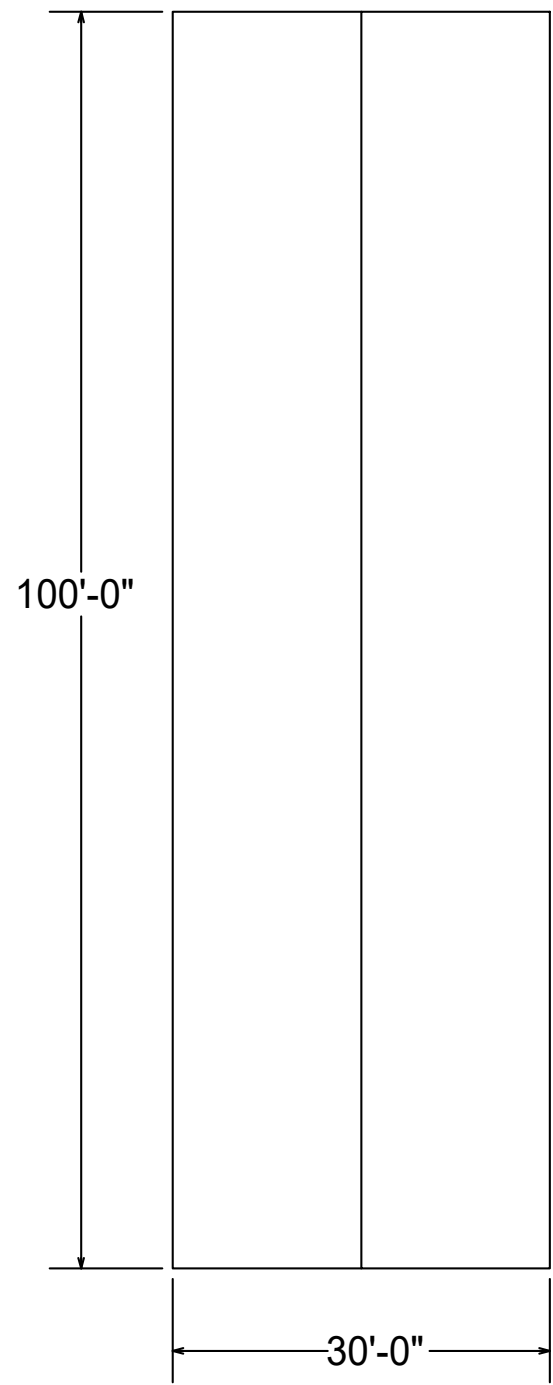
RIGHT ELEVATION

N.T.S.
NOTE: SEE SHEET A4 FOR ANCHORING DETAILS
(NOTE: ALL FRAMING SHALL BE 2"X 3" RECTANGULAR TUBING)

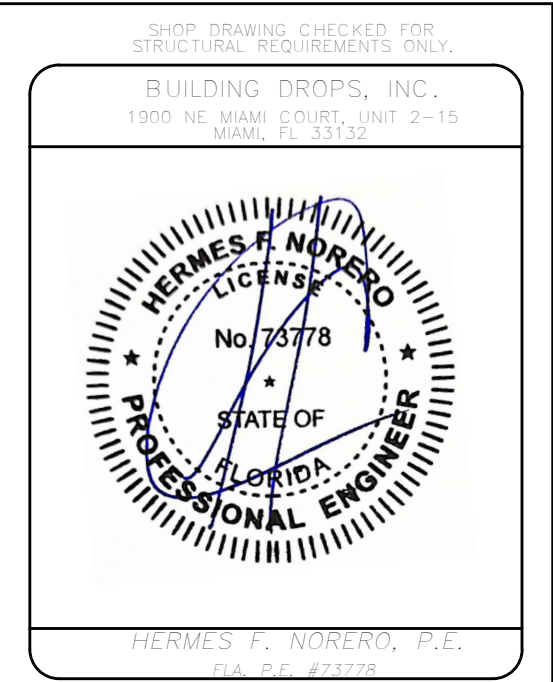


LEFT ELEVATION

N.T.S.
NOTE: SEE SHEET A4 FOR ANCHORING DETAILS
(NOTE: ALL FRAMING SHALL BE 2"X 3" RECTANGULAR TUBING)



SITE-SPECIFIC DESIGN PLAN
SCALE 1" = 200'



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ORANGE CITY, FL 32763
OFFICE: 813.996.7431
www.superiorsheds.com

**SUPERIOR
SHEDS**

PUBLIC WORKS FACILITY
301 MAGUIRE ROAD
OCOOEE, FL 34761

TITLE:

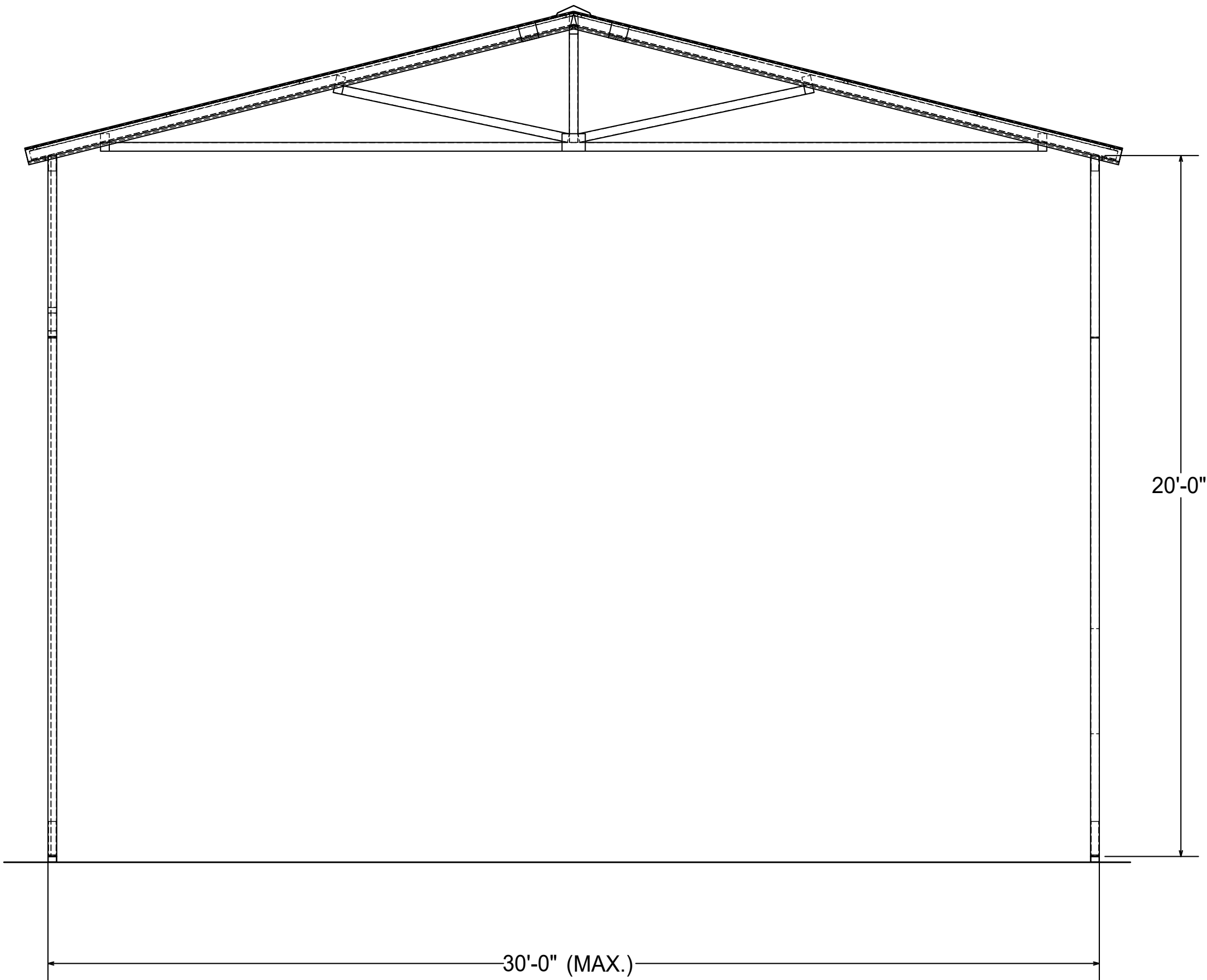
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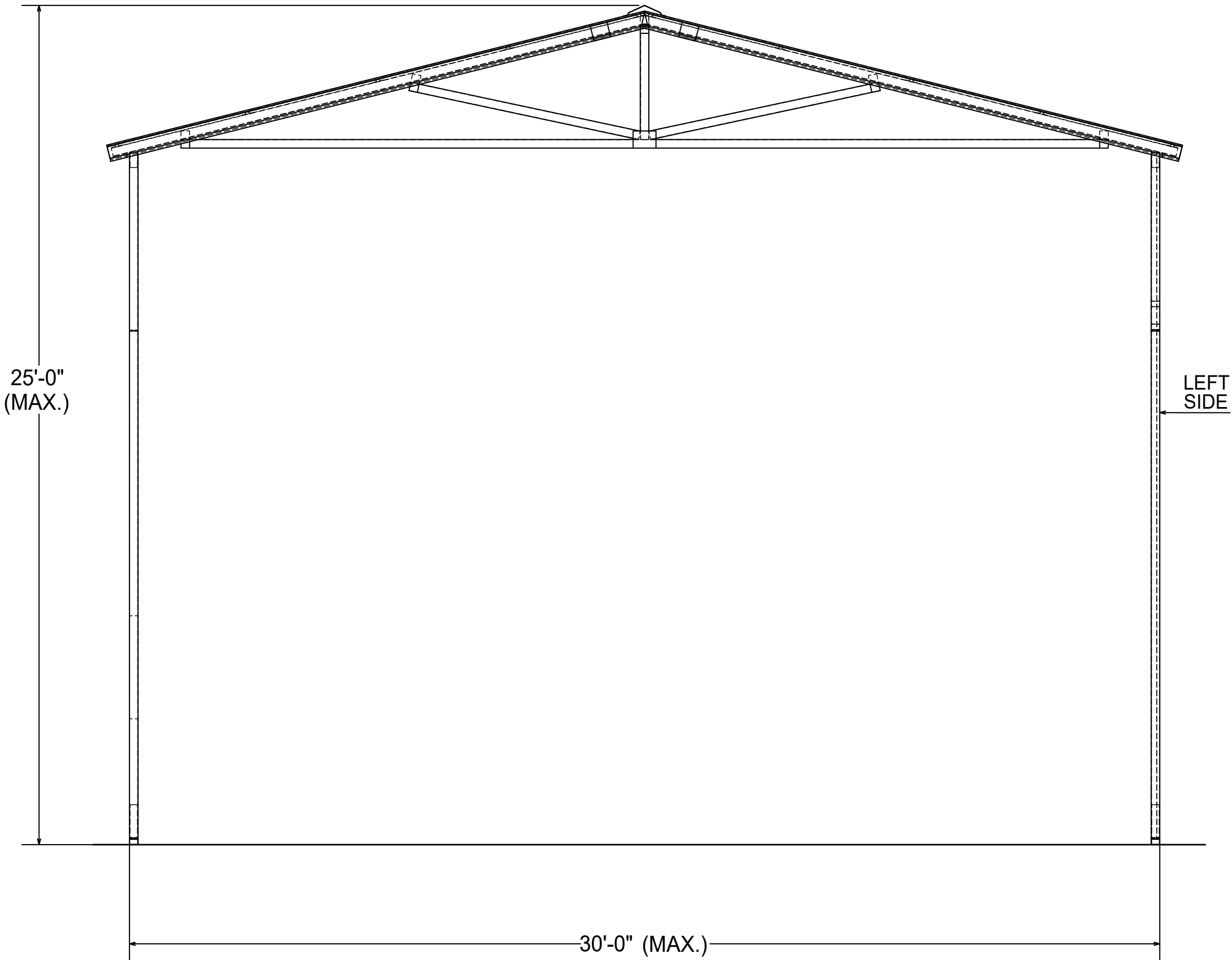
JOB SUP108

SHEET NO.

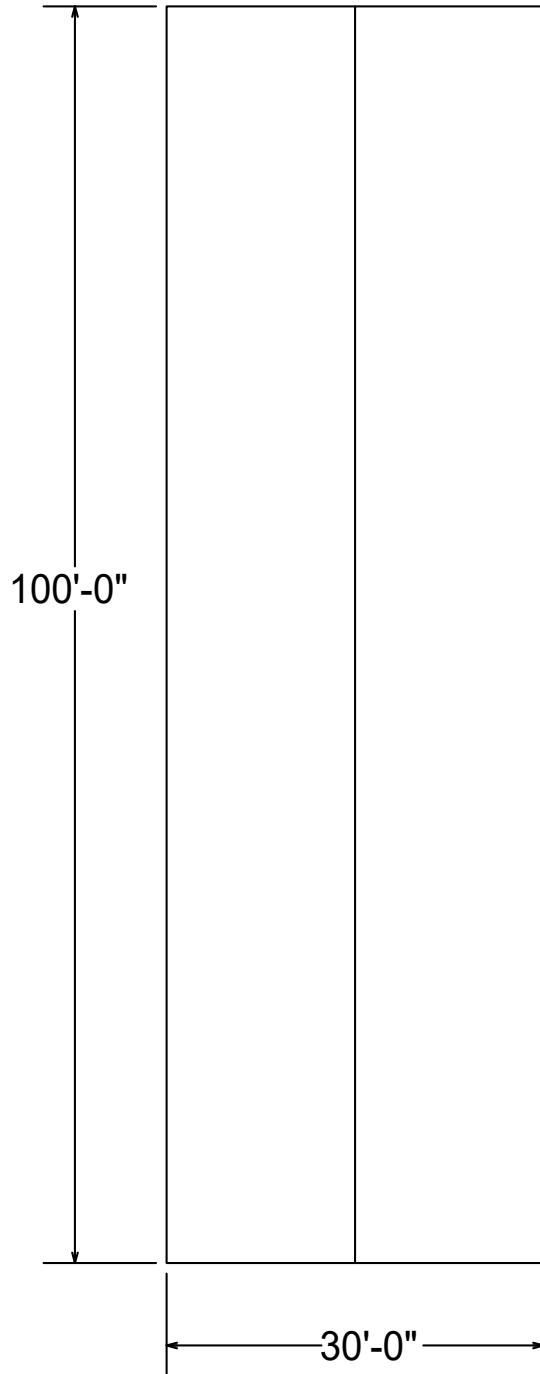
A2



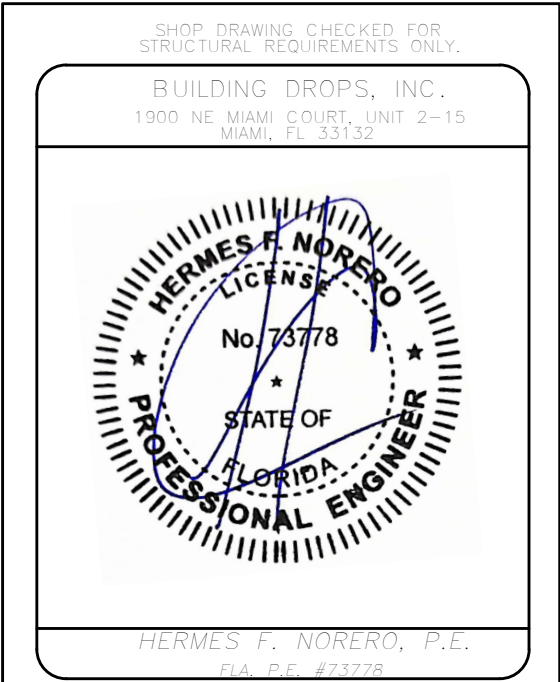
FRONT ELEVATION
N.T.S.
(SUPPORT WITH SIDING)
NOTE: SEE SHEET A4 FOR ANCHORING DETAILS
(NOTE: ALL FRAMING SHALL BE 2"X 3" RECTANGULAR TUBING)



REAR ELEVATION
N.T.S.
(SUPPORT WITH SIDING)
NOTE: SEE SHEET A4 FOR ANCHORING DETAILS
(NOTE: ALL FRAMING SHALL BE 2"X 3" RECTANGULAR TUBING)



SITE-SPECIFIC DESIGN PLAN
SCALE 1"=200'

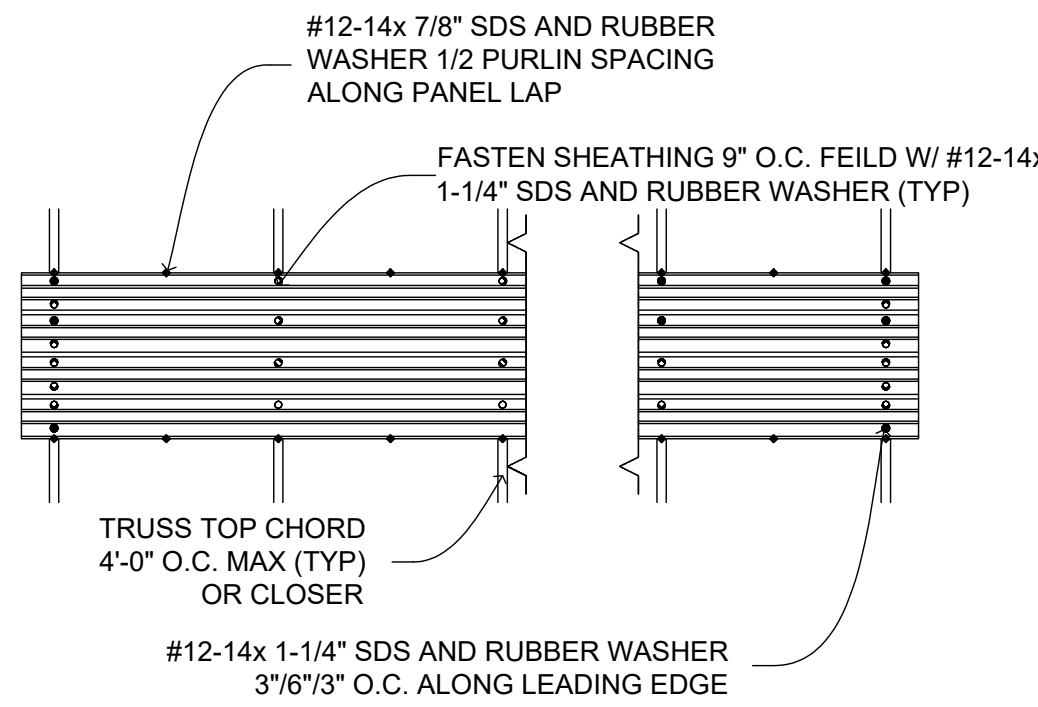


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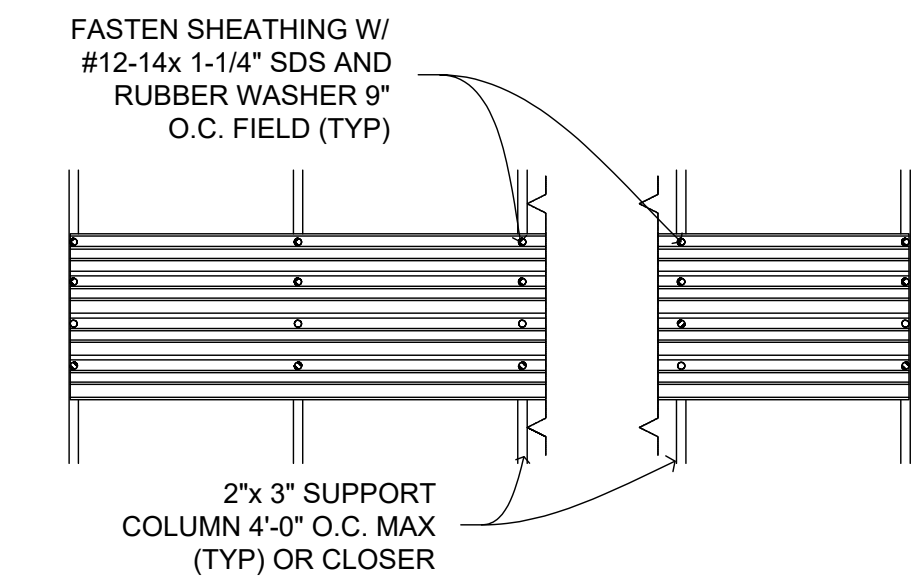


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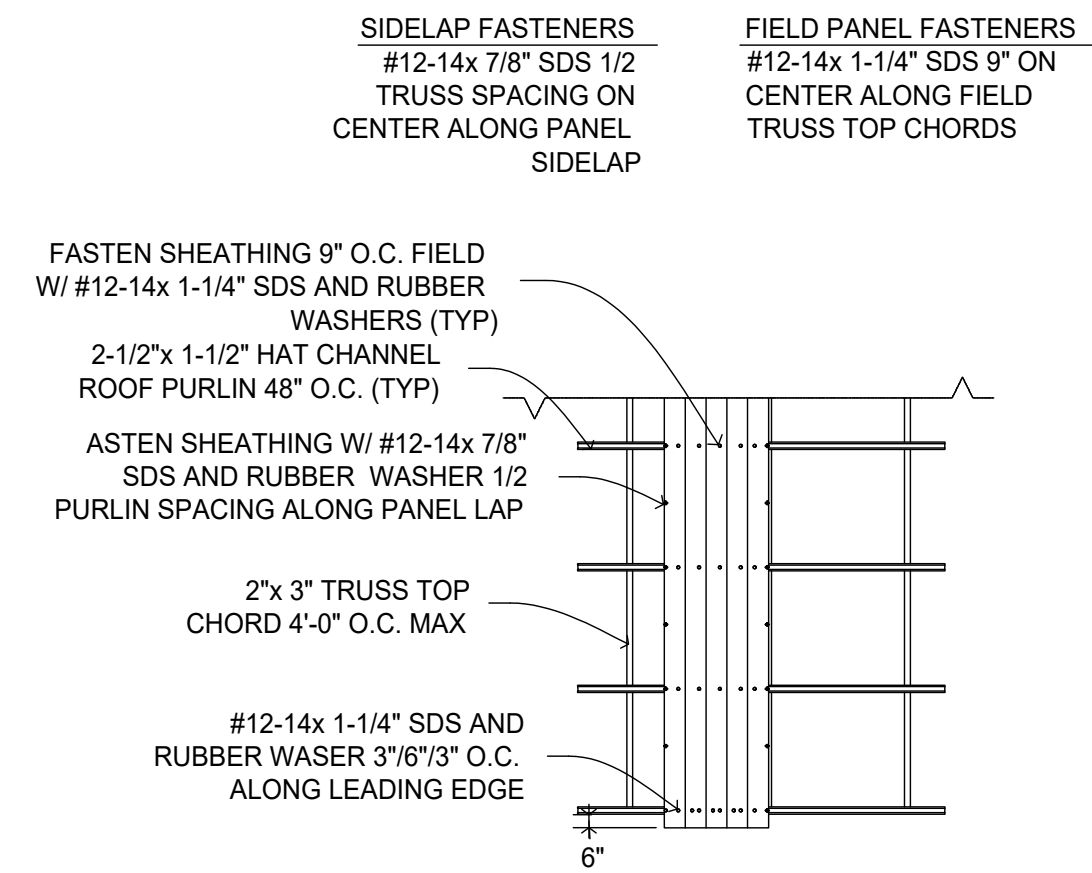
TITLE:	
DATE	
DRAWN	E.ROM
JOB	SUP108
SHEET NO.	A3



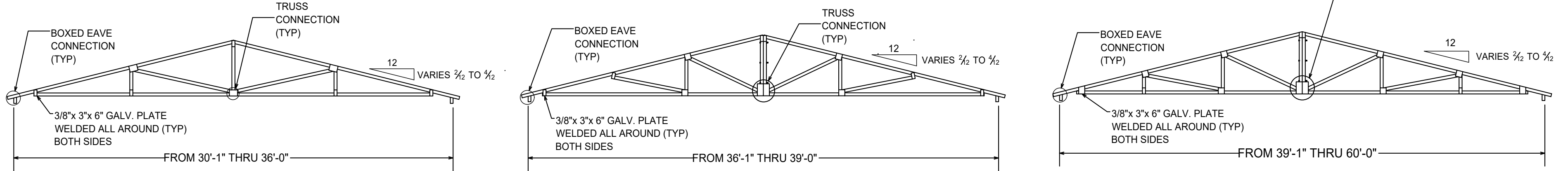
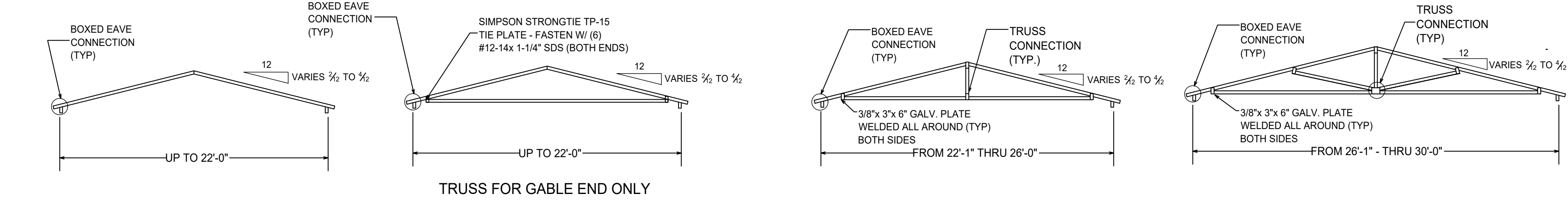
UNIVERSAL FASTENING SCHEDULE HORIZONTAL ROOFING PANELS ACROSS TRUSS TOP CHORD
N.T.S.



UNIVERSAL FASTENING SCHEDULE SIDING PANELS ACROSS SUPPORT COLUMNS
N.T.S.

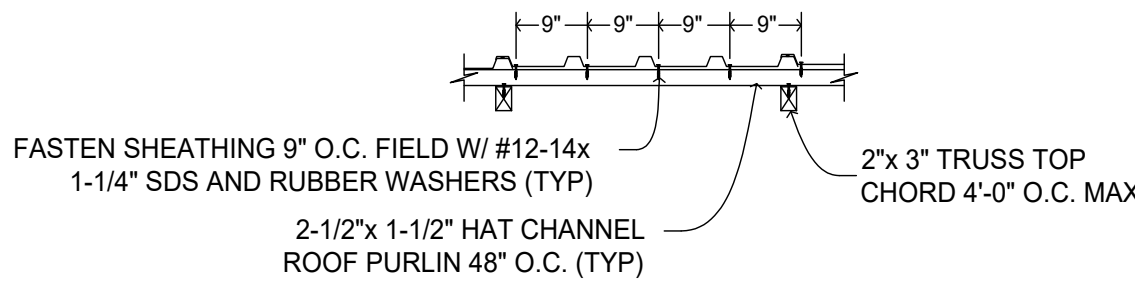


UNIVERSAL FASTENING SCHEDULE VERTICAL ROOFING PANELS ACROSS PURLINS
N.T.S.

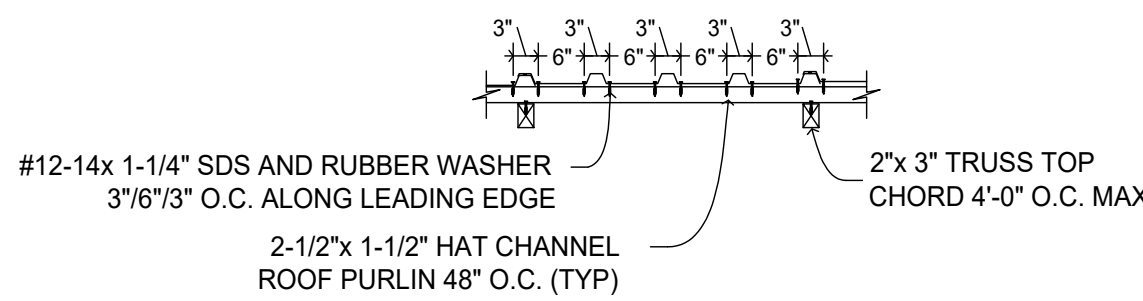


TRUSS CONFIGURATIONS
N.T.S.

NOTE: ALL CONNECTIONS IN A 136 MPH WIND ZONE WILL BE WELDED ALL AROUND CONNECTION



FIELD FASTENING PATTERN
N.T.S.



LEADING EDGE FASTENING PATTERN
N.T.S.

DESCRIPTION	FIELD		LEADING EDGE
	ZONE 1	ZONE 2	ZONE 3
MAXIMUM UPLIFT DESIGN PRESSURE	-29.82	-42.26	-59.64
FASTENER PATTERN	9"- 9"- 9"- 9"		6"- 3"- 6"- 3"- 6"
SUPPORT SPACING	48" O.C.		48" O.C.

GENERAL NOTES:

1. ALL CONCRETE WORK SHALL BE 3,000 P.S.I. AT 28 DAYS.
2. MINIMUM SOIL BEARING SHALL BE ASSUMED AT 2,000 P.S.F.
3. ALL CONSTRUCTION SHALL BE PROVIDED IN ACCORDANCE WITH THE 2023 8TH EDITION FLA. BLDG. CODE AND ASCE 7-22.

THESE PLANS INCLUDE DESIGN FOR ALL WIND

4. ALL SIDING AND ROOFING TO MINIMUM OF 26 GAUGE ATTACHED TO THE COLUMNS AS SHOWN AND CONSIDERED TO BE A MIN. OF 3 SPAN.
5. FOR ZONE LOCATIONS SEE FBC FIGURE 1609(C), THE COMPONENTS AND CLADDING LOADING CHARTS THIS SHEET.
6. DESIGN LOADINGS:
DEAD LOAD = 4 PSF
ROOF LIVE LOAD = 20 PSF
7. DOOR AND WINDOW DATA: PER TABLE
8. ALL WINDOWS AND MAN DOORS MAY USE #12-14x 1-1/4" LONG SELF DRILLING SCREWS IN LIEU OF THE WOOD SCREWS WHEN CONNECTING THE UNITS TO METAL FRAME. FOLLOW THE MANUFACTURERS SPECIFICATIONS FOR LOCATING CONNECTORS.
9. TYPE OF CONSTRUCTION: TYPE II-B
10. CORNER BRACES REQUIRED.

VELOCITY ULTIMATE	COMPONENTS AND CLADDING (exp=C, gcpi=+/-0.18 (ENCLOSED))					
	PRESSURE (PSF)					
	ROOF		3	WALLS		
	1	2		4/5 AVG NORMAL	4/5 AVG PARALLEL	
136 MPH	-29.82	-42.26	-59.64	+26.52	+26.52	-28.74

DESIGN VELOCITY ULTIMATE	WIND SPEED VS. LEG SPACING AND CLADDING TABLE	
	4' ON CENTER	5' ON CENTER
-	-	-
150 MPH	-	29 GA.
160 MPH	29 GA.	-
170 MPH	29 GA.	-
175 MPH	29 GA.	-

WELDING TABLE	
1/8 FILLET	
1/8 1/8 SQUARE	
1/8 BUTT	

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TITLE:

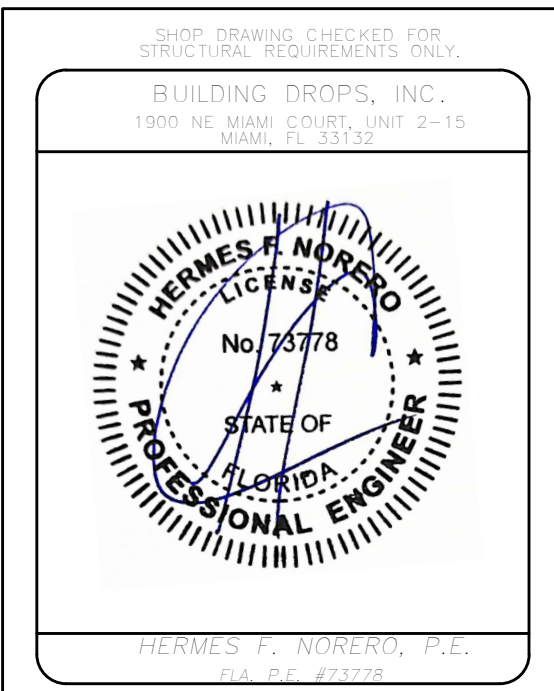
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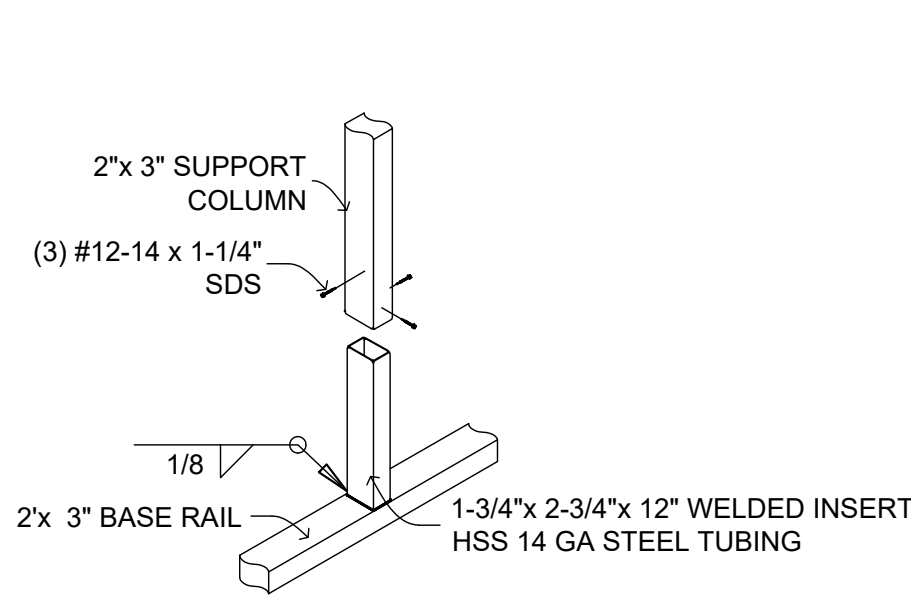
DRAWN E.ROM

JOB SUP108

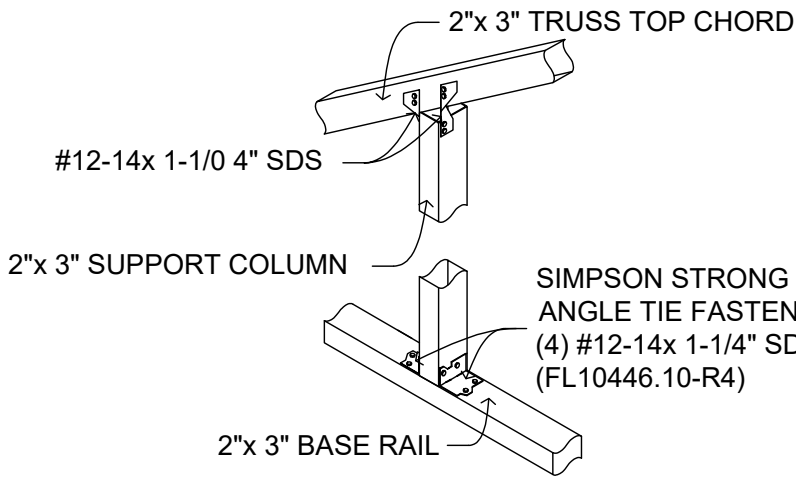
SHEET NO.

A4

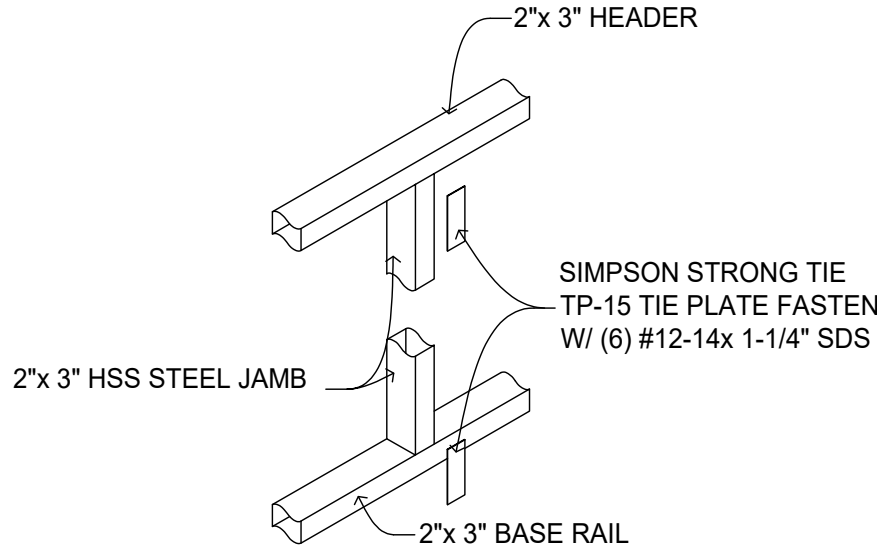




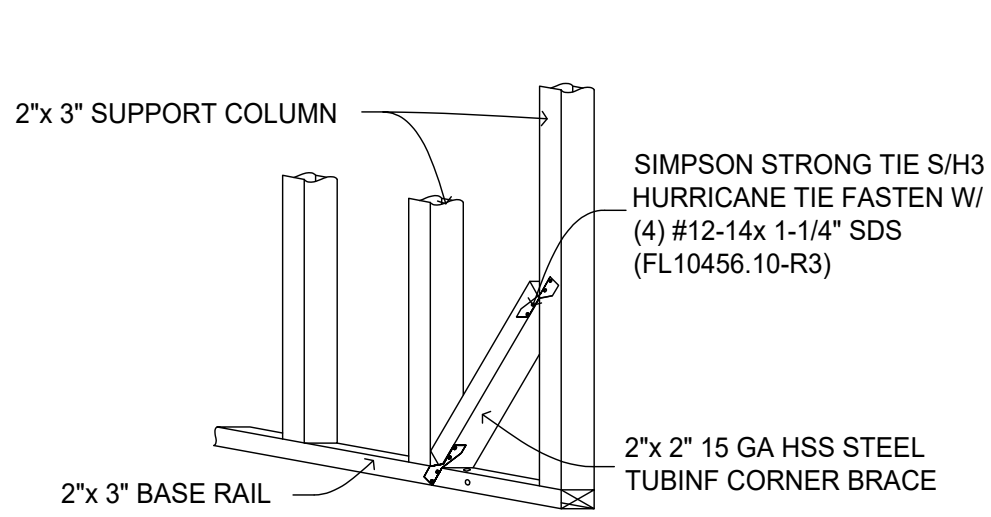
A SUPPORT COLUMN TO SIDE BASE RAIL CONNECTION (INTERIOR PERSPECTIVE)
N.T.S.



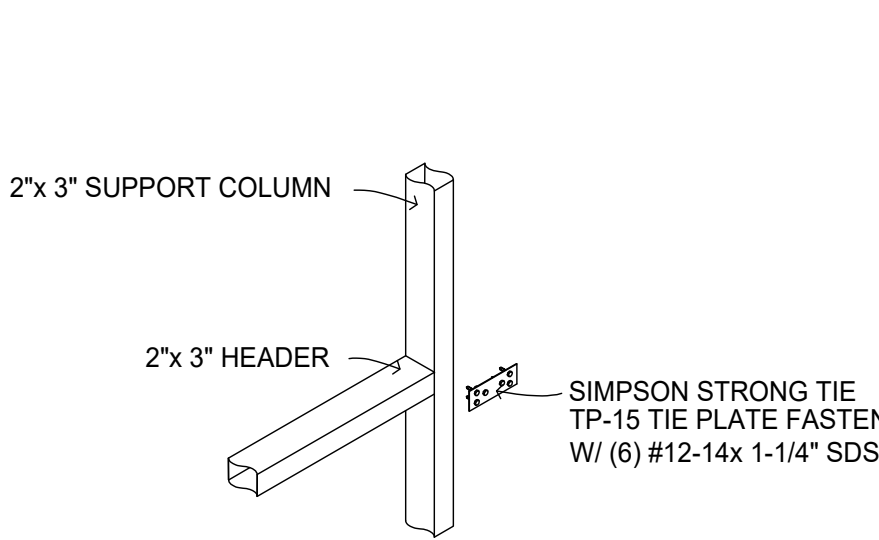
B GABLE COLUMN TO BASE RAIL CONNECTION
N.T.S.



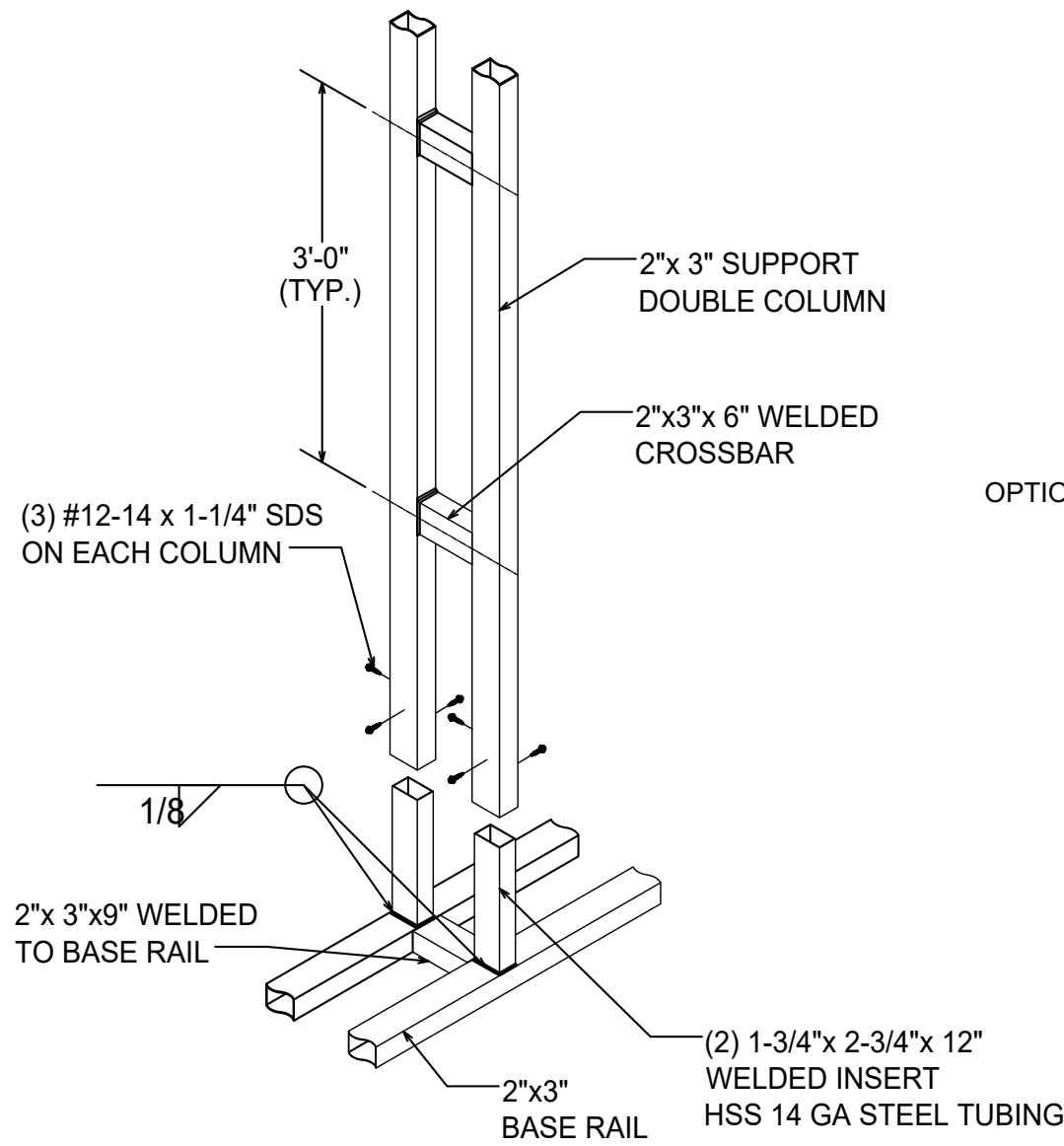
C SIMPLE JAMB CONNECTION
N.T.S.



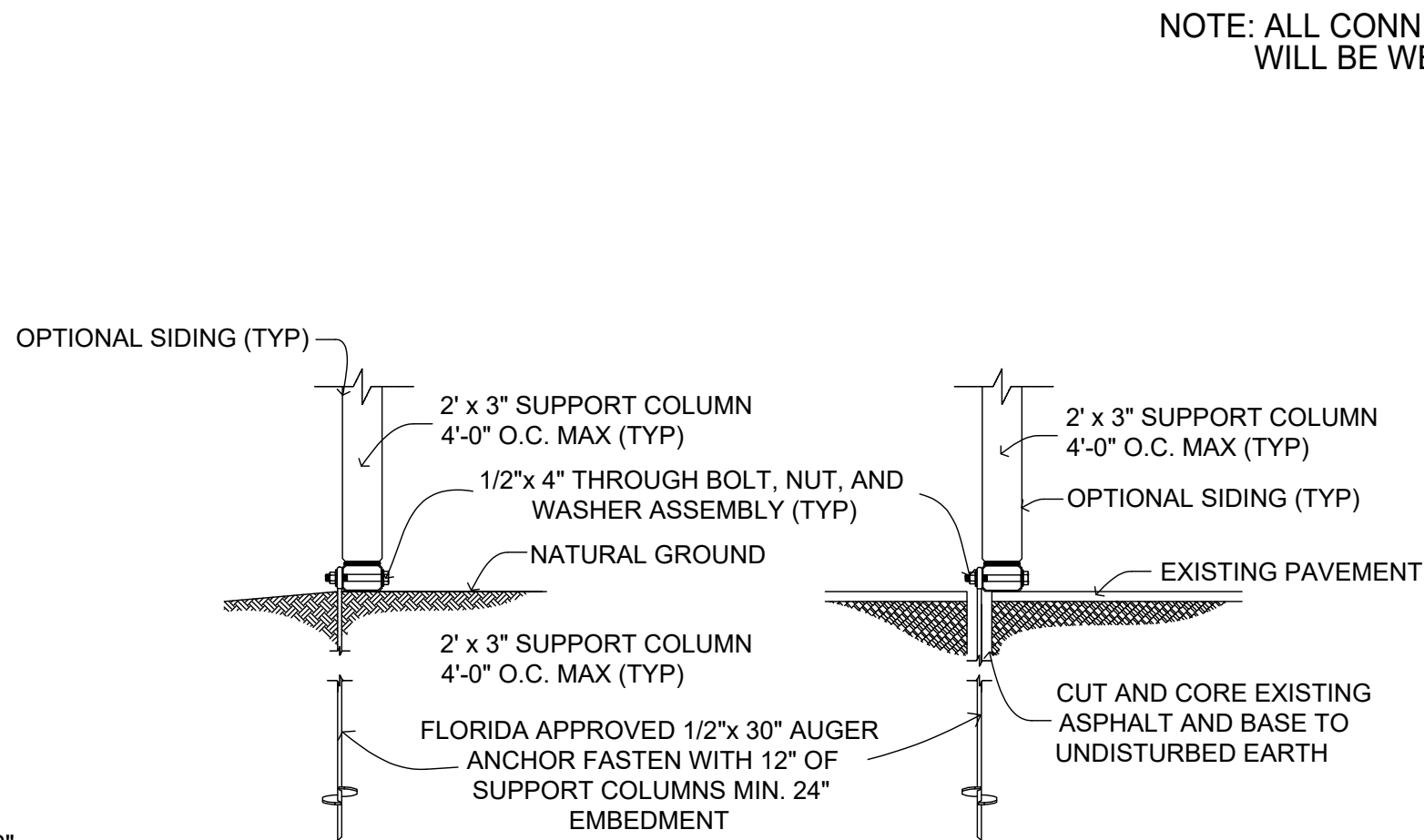
D CORNER BRACE CONNECTION
N.T.S.



E SIMPLE HEADER CONNECTION
N.T.S.

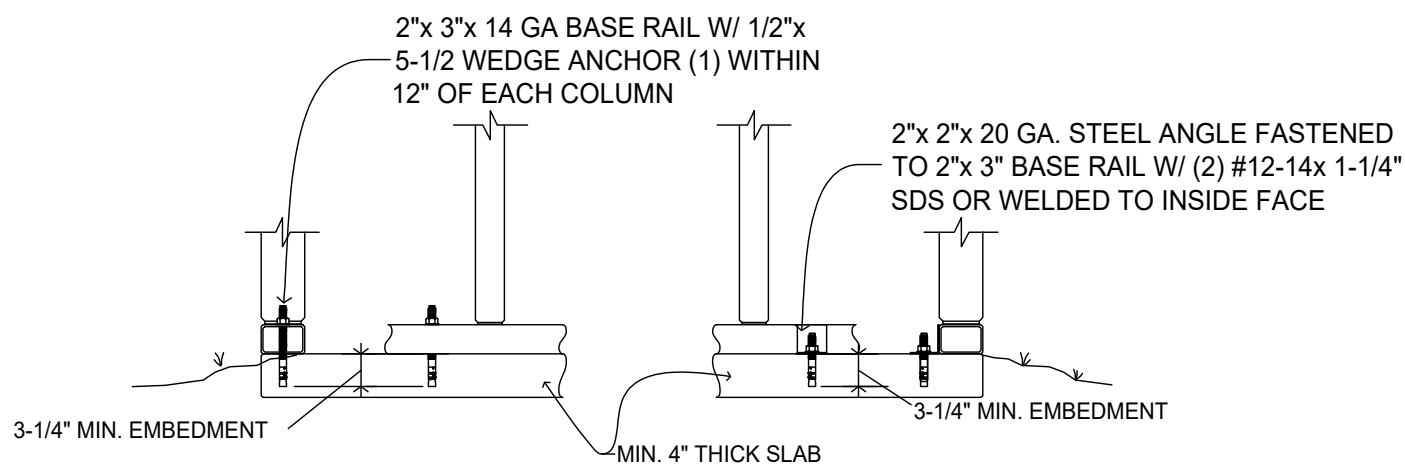


F SUPPORT DOUBLE COLUMN TO SIDE BASE RAIL CONNECTION (EXTERIOR PERSPECTIVE)
N.T.S.



AUGER MUST BE RATED FOR AN ALLOWABLE PULL OUT RESISTANCE OF 500 LBS OR GREATER
AUGER SHALL BE UNDER SEPARATE APPROVAL. REFER TO MANUFACTURER'S PUBLISHED DATA OR PRODUCT APPROVAL

G NO FOUNDATION/BARE GROUND
N.T.S.

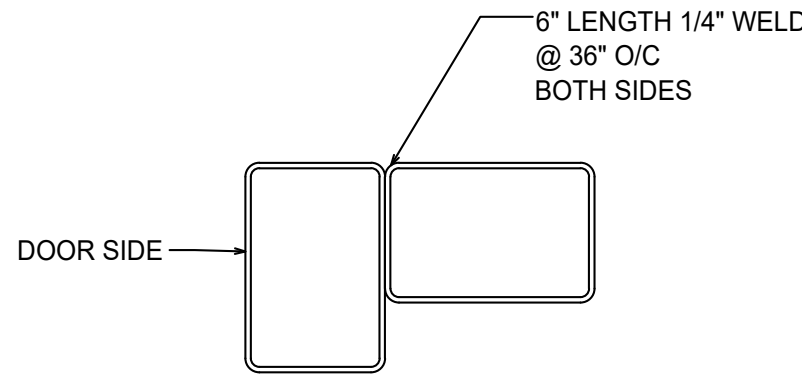


FOUNDATION CONTRACTOR TO PROVIDE FOR MINIMUM SLOPE OF 6" IN THE FIRST 10' AWAY FROM FOUNDATION (SECTION R401.3 2023 8TH EDITION FLA. BLDG. CODE)

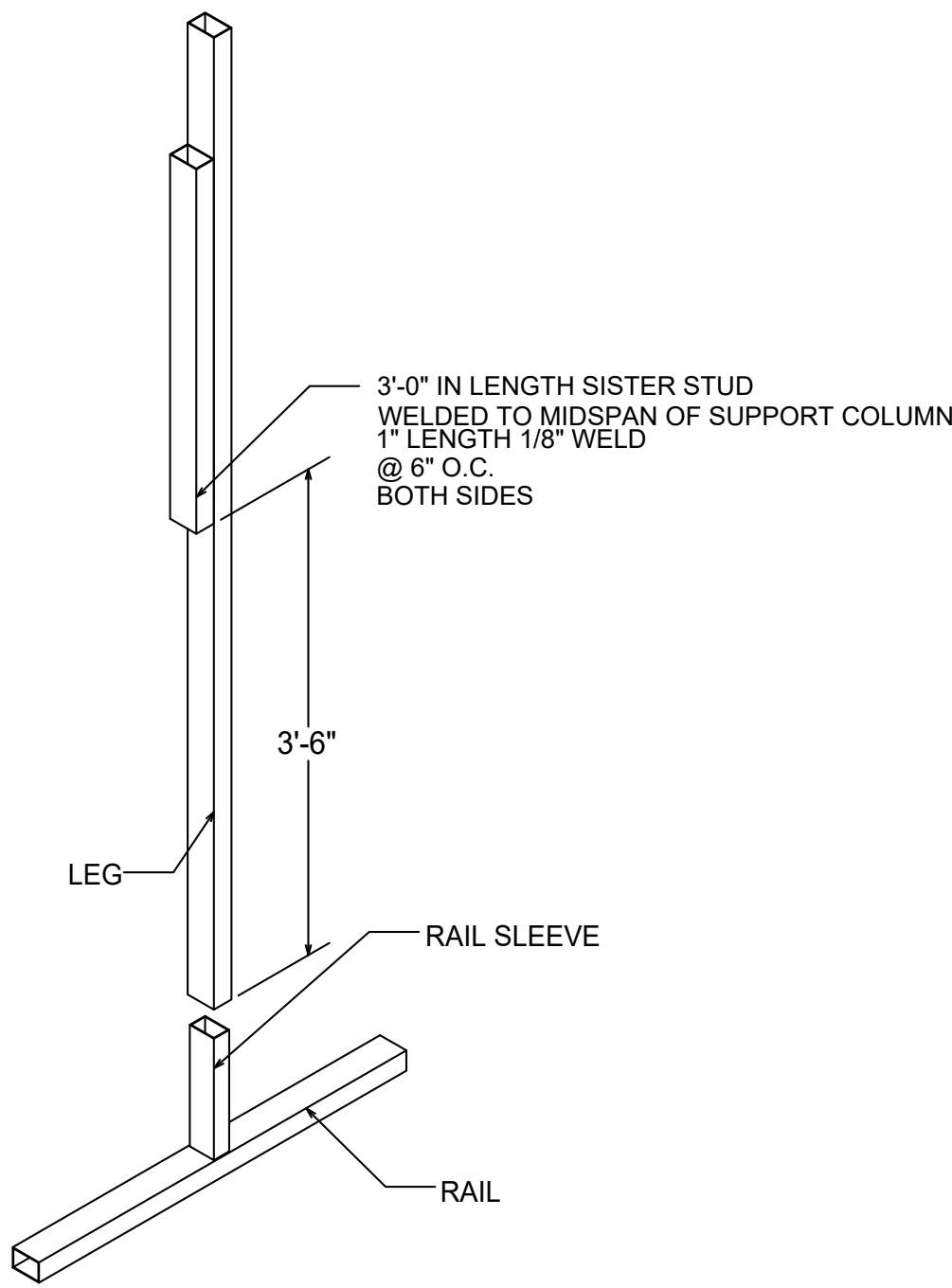
WEDGE MUST BE RATED FOR AN ALLOWABLE PULL OUT RESISTANCE OF 500 LBS OR GREATER

WEDGE SHALL BE UNDER SEPARATE APPROVAL. REFER TO MANUFACTURER'S PUBLISHED DATA OR PRODUCT APPROVAL

H FOUNDATION AND ANCHORING EXISTING CONCRETE/DIRECT ANCHORING
N.T.S.

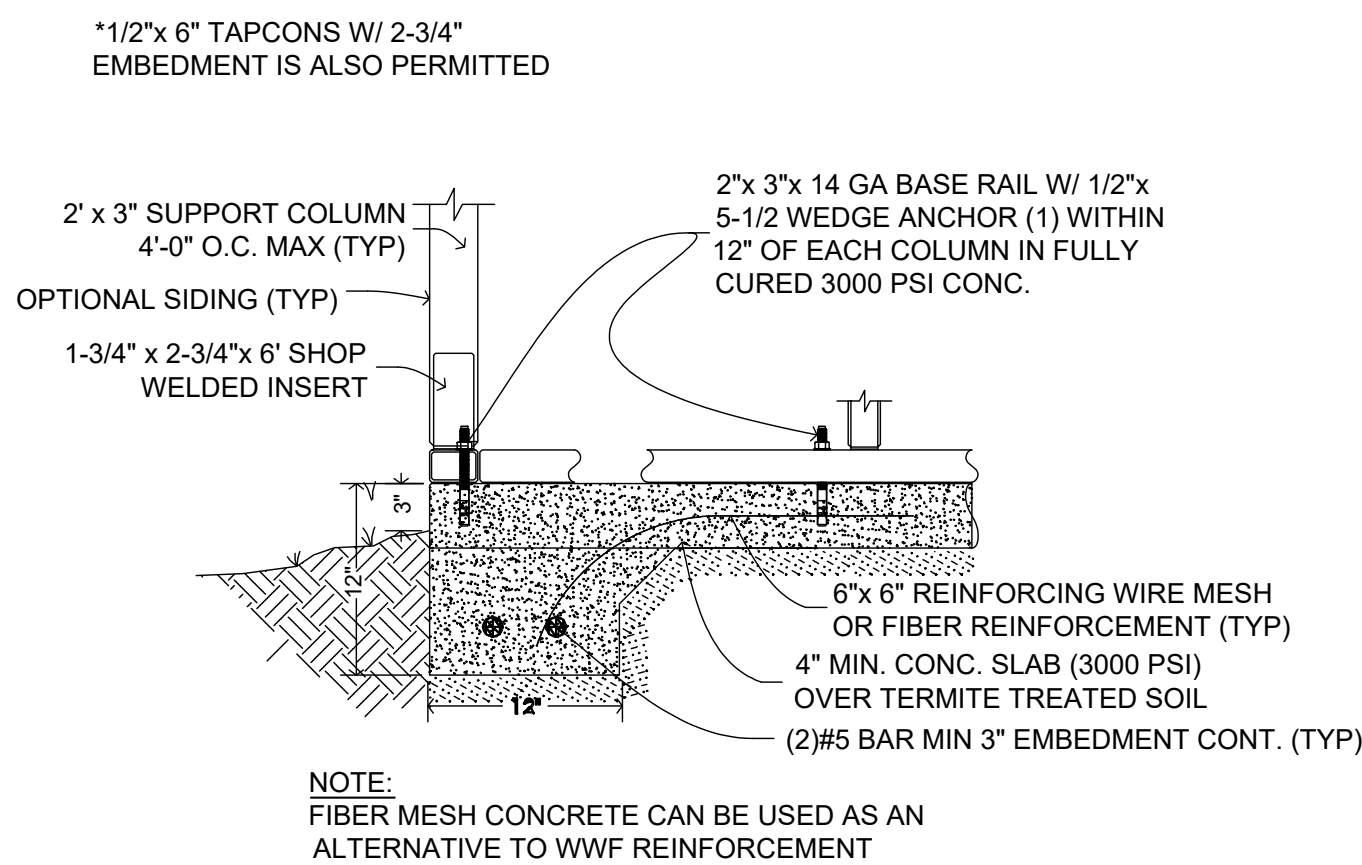


I ROLL UP DOOR JAMB DETAIL
N.T.S.

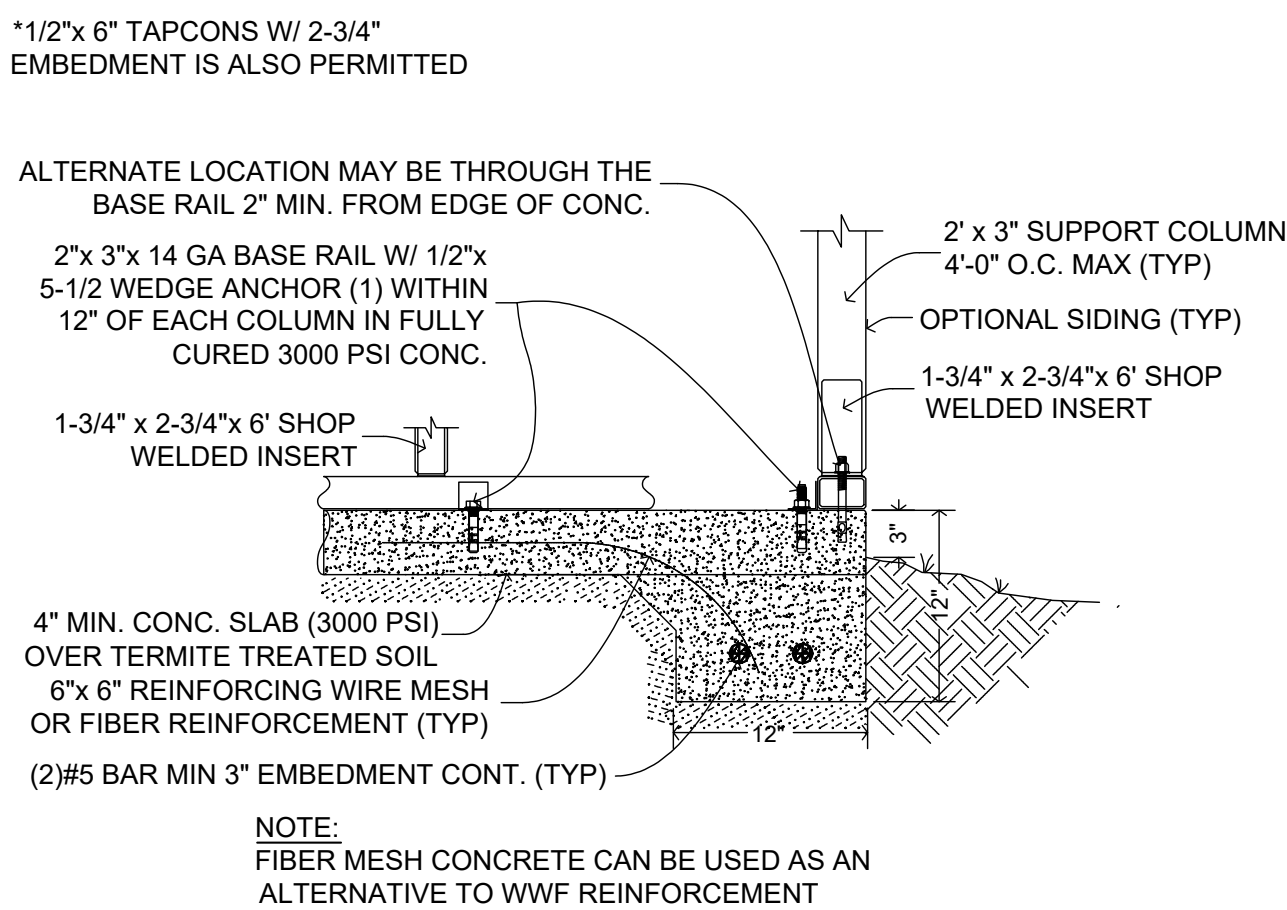


NOTE: SISTER STUDS TO BE ADDED @12'-0" AND HIGHER COLUMNS

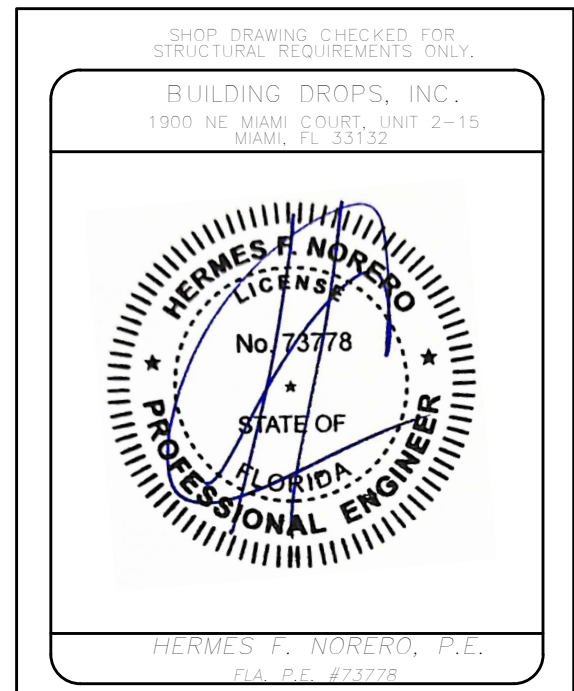
J SISTER STUD DETAIL
N.T.S.



K NEW CONCRETE/ DIRECT ANCHORING
N.T.S.



L NEW CONCRETE/ OFFSET ANCHORING
N.T.S.



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TITLE:

DATE

DRAWN **E.ROM**

JOB **SUP108**

SHEET NO.

A5



STAFF REPORT

Meeting Date: May 21, 2024
Item #: 8

Contact Name: Stephen Krug
Contact Number: Ext. 6002

Department Director: Stephen Krug
City Manager: Robert Frank

Subject: Approval of Change Order No.1 for Contracted Sidewalk Repairs Utilizing Existing City of Kissimmee Contract with APEC LLC. (Public Works Director Krug)

Background Summary:

The City Commission approved funding in the current budget to perform contracted sidewalk repairs and on February 6, 2024, approved the use of the existing competitively bid City of Kissimmee contract IFB2022-002, Alternative Paving Methods, awarded to APEC, LLC, which also includes sidewalk replacement items. APEC is one of the City's continuing contractors for small construction services providers (RFQ22-005). The original approval for \$103,744.56 did not exhaust the budget for sidewalk replacement and allowed the contractor to start the work. Public Works is requesting Commission approval of Change Order No. 1 in the amount of \$182,116.08 in order to incorporate additional replacement locations into the previously awarded work. This additional work will leave approximately \$14,000.00 in the allocated budget for small field changes which may be required. Public Works recommends approval of this Change Order to complete the sidewalk replacement process for the current fiscal year.

Issue:

Should the Honorable Mayor and City Commissioners approve Change Order No. 1 for contracted sidewalk repairs, utilizing an existing City of Kissimmee contract with APEC, LLC?

Recommendations:

Staff recommends the Honorable Mayor and City Commissioners approve Change Order No. 1 for the contracted sidewalk repairs with APEC, LLC, utilizing the existing competitively bid, City of Kissimmee contract IFB2022-002, in the amount of \$182,116.08, and authorize the City Manager and Staff to approve change orders to this contract up to the limit of his purchasing authority for each change order, and up to the budgeted amount for this project for all change orders.

Attachments:

1. Ocoee Sidewalk Survery Assessment as of 4.29.2024
2. APEC Proposal City of Ocoee Sidewalk CO 1 May 2024
3. APEC Sidewalk Quantities CO 1 May 2024
4. Change Order No. 1

Financial Impacts:

The work is adequately funded in the Public Works Streets Division budget.

City of Ocoee ▪ 1 N. Bluford Avenue ▪ Ocoee, Florida 34761
Phone: (407) 905-3100 ▪ www.ocoe.org

Type of Item: Consent

ObjectID	Inspection Date Time	Sidewalk Assessment		Latitude Coordinate	Longitude Coordinate	Street Name	Full Address	Sidewalk Type	Repair Priority Level	Primary Cause of Damage
		Zone Number								
95	1/22/2024 18:31	20		28.562260125790313	-81.51051971137665	Climbing Rose Dr	1262 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
96	1/22/2024 19:19	20		28.56221177119938	-81.51070315260104	Climbing Rose Dr	1262 Climbing Rose Drive	Sidewalk along Roadway	Medium	Buckling
97	1/22/2024 19:22	20		28.56228713123751	-81.51033660412813	Climbing Rose Dr	1258 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
98	1/22/2024 19:30	20		28.56237054794867	-81.509915598854	Climbing Rose Dr	1253 Climbing Rose Drive	Sidewalk along Roadway	Medium	Other
99	1/22/2024 21:07	10		28.582361169108882	-81.53250615475037	Russell Dr	1244 Russell Drive	Sidewalk along Roadway	Medium	Driven Over
100	2/6/2024 20:53	13		28.583359974463118	-81.5097280406221	Lochshyre Loop	1883 Lochshyre Loop	Sidewalk along Roadway	Medium	Driven Over
101	2/6/2024 21:00	13		28.583439013868098	-81.50978384058232	Lochshyre Loop	1889 Lochshyre Loop	Sidewalk along Roadway	Medium	Other
102	2/7/2024 14:15	18		28.561704028424398	-81.53914231814588	Banderas Ave	603 Banderas Avenue	Sidewalk along Roadway	Medium	Tree Roots
103	2/7/2024 14:20	18		28.561596590953865	-81.53915126484654	Banderas Ave	605 Banderas Avenue	Sidewalk along Roadway	High	Tree Roots
104	2/7/2024 14:24	18		28.56160615647655	-81.53911748923926	Banderas Ave	605 Banderas Avenue	Sidewalk along Roadway	High	Tree Roots
105	2/7/2024 14:28	18		28.56160673039951	-81.53913990933118	Banderas Ave	605 Banderas Avenue	Sidewalk along Roadway	High	Tree Roots
106	2/8/2024 19:28	16		28.572950488914337	-81.52158994235239	Olympus Dr		Sidewalk along Roadway	Medium	Tree Roots
107	2/13/2024 20:03	7		28.587781555504428	-81.53650440060649	Wurst Rd	462 Wurst Road	Sidewalk along Roadway	Medium	Tree Roots
108	2/13/2024 20:13	7		28.58769984110112	-81.5365626836455	Wurst Rd	462 Wurst Road	Sidewalk along Roadway	Medium	Tree Roots
109	2/14/2024 18:34	15		28.562832777414993	-81.53366524733745	E Orlando Ave		ADA Ramp at Intersection	Medium	Driven Over
110	2/14/2024 18:38	15		28.56284046614784	-81.53349235002639	E Orlando Ave		Sidewalk along Roadway	Medium	Poor Construction
111	2/15/2024 21:29	19		28.562743154200632	-81.52980130555898	E Orlando Ave		Sidewalk along Roadway	High	Tree Roots
112	2/15/2024 21:38	19		28.562752097742596	-81.5294188362018	E Orlando Ave		Sidewalk along Roadway	High	Other
113	2/19/2024 18:49	12		28.577740188991523	-81.52554398916772	Wanda St	1400 Wanda Street	ADA Ramp at Intersection	Medium	Driven Over
114	2/19/2024 18:52	12		28.57777918473917	-81.5258147565608	Wanda St	1400 Wanda Street	Sidewalk along Roadway	Medium	Tree Roots
115	2/19/2024 20:08	12		28.57767968441231	-81.52502115823471	Wanda St	1402 Wanda Street	Sidewalk along Roadway	Medium	Driven Over
116	2/19/2024 20:13	12		28.57773624881472	-81.5253052017358	Wanda St	1404 Wanda Street	Sidewalk along Roadway	Medium	Tree Roots
117	2/19/2024 20:17	12		28.577755523852517	-81.52508554637866	Wanda St	1404 Wanda Street	Sidewalk along Roadway	Medium	Poor Construction

118	2/19/2024 20:20 12	28.577745886936725	-81.52505433596748	Wanda St	1406 Wanda Street	Sidewalk along Roadway	High	Tree Roots
119	2/19/2024 20:25 12	28.577742270694753	-81.524914109502	Wanda St	1406 Wanda Street	Sidewalk along Roadway	Medium	Tree Roots
120	2/19/2024 20:28 12	28.577745505220708	-81.52461663382847	Wanda St	1408 Wanda Street	Sidewalk along Roadway	Medium	Driven Over
121	2/19/2024 20:30 12	28.577754642044873	-81.52461260061142	Wanda St	1408 Wanda Street	Sidewalk along Roadway	Medium	Poor Construction
122	2/19/2024 20:33 12	28.57777315716236	-81.52456066441479	Wanda St	1410 Wanda Street	Sidewalk along Roadway	Low	Poor Construction
123	2/19/2024 20:36 12	28.57774743184787	-81.52442154426433	Wanda St	1410 Wanda Street	Sidewalk along Roadway	Low	Poor Construction
124	2/19/2024 20:37 12	28.57775965852532	-81.52432709636223	Wanda St	1410 Wanda Street	ADA Ramp at Intersection	Medium	Driven Over
125	2/22/2024 19:10 13	28.57407642996737	-81.51512883611164	Lake Johio Rd		Sidewalk along Roadway	Medium	Tree Roots
126	2/22/2024 21:13 13	28.579768212114097	-81.50869279929798	Springfield Dr	2700 Springfield Drive	Sidewalk along Roadway	High	Tree Roots
127	2/22/2024 21:17 13	28.579896096024527	-81.50874928053705	Springfield Dr	2700 Springfield Drive	Sidewalk along Roadway	High	Tree Roots
128	2/23/2024 13:44 16	28.56746641921677	-81.53107834056162	Bismark Ct	131 Bismark Court	Sidewalk along Roadway	High	Tree Roots
129	2/23/2024 13:49 16	28.567449706860486	-81.53134965464926	Bismark Ct	147 Bismark Court	Sidewalk along Roadway	High	Tree Roots
130	2/23/2024 13:52 16	28.56724998275353	-81.53157971833507	Bismark Ct	171 Bismark Court	Sidewalk along Roadway	High	Tree Roots
131	2/23/2024 13:55 16	28.567376604333255	-81.53122181572539	Bismark Ct	122 Bismark Court	Sidewalk along Roadway	High	Tree Roots
132	2/23/2024 13:58 16	28.567380509629306	-81.53075262796027	Bismark Ct	111 Bismark Court	Sidewalk along Roadway	High	Tree Roots
133	2/23/2024 14:00 16	28.567650269494525	-81.5308170359892	Bismark Ct	119 Bismark Court	Sidewalk along Roadway	High	Tree Roots
134	2/23/2024 14:02 16	28.56759425157683	-81.53097570534513	Bismark Ct	119 Bismark Court	Sidewalk along Roadway	High	Tree Roots
135	2/26/2024 18:50 20	28.560505625818486	-81.51377264417849	Neumann Village Ct	661 Neumann Village Court	Sidewalk along Roadway	High	Tree Roots
136	2/29/2024 18:52 17	28.562988345537857	-81.51722707793257	S Clarke Rd		Sidewalk along Roadway	Medium	Driven Over
137	2/29/2024 18:56 17	28.563050990093117	-81.5173061232647	S Clarke Rd		Sidewalk along Roadway	Medium	Driven Over
138	3/1/2024 15:37 16	28.567047533605773	-81.5278326161965	Keaton Pkwy		Sidewalk along Roadway	Medium	Tree Roots
139	3/1/2024 15:41 16	28.567119072870074	-81.52782577067025	Keaton Pkwy		Sidewalk along Roadway	Medium	Tree Roots
140	3/1/2024 15:44 16	28.56733640451803	-81.52812296704853	Keaton Pkwy		Sidewalk along Roadway	Medium	Tree Roots
141	3/1/2024 15:45 16	28.567251449853373	-81.52808679439268	Keaton Pkwy		Sidewalk along Roadway	Medium	Tree Roots
142	3/4/2024 18:53 12	28.57399659233966	-81.52132264346025	Silver Crest Blvd		Sidewalk along Roadway	Medium	Tree Roots
143	3/4/2024 19:46 10	28.58295523639448	-81.5352687874284	Little Spring Hill Dr	409 Little Spring Hill Drive	Sidewalk along Roadway	Medium	Driven Over
144	3/4/2024 20:00 10	28.58298082722762	-81.53502601332603	Little Spring Hill Dr	411 Little Spring Hill Drive	Sidewalk along Roadway	High	Driven Over
145	3/7/2024 19:08 12	28.574391840983715	-81.52156974196575	Silver Crest Blvd		Sidewalk along Roadway	Medium	Tree Roots
146	3/7/2024 19:11 12	28.574464654438664	-81.52151976092026	Silver Crest Blvd		Sidewalk along Roadway	Medium	Tree Roots
147	3/7/2024 19:14 12	28.57457147375934	-81.52155462817576	Silver Crest Blvd		Sidewalk along Roadway	Medium	Tree Roots
148	3/7/2024 19:19 12	28.575081279889456	-81.52155027868851	Silver Crest Blvd		ADA Ramp at Intersection	Medium	Driven Over
149	3/7/2024 19:22 12	28.574879079699873	-81.52163029935164	Silver Crest Blvd		Sidewalk along Roadway	Medium	Tree Roots

150	3/14/2024 14:39 10	28.583668721866406	-81.5420698654666	Laurel Ridge Ave	111 Laurel Ridge Avenue	Sidewalk along Roadway	Medium	Tree Roots
151	3/14/2024 14:48 10	28.58358456233443	-81.54202981399423	Laurel Ridge Ave	115 Laurel Ridge Avenue	Sidewalk along Roadway	Medium	Tree Roots
152	3/14/2024 20:03 13	28.58260560359037	-81.50760440408165	E H Pounds Dr	2252 E H Pounds Drive	Sidewalk along Roadway	Medium	Tree Roots
153	4/9/2024 17:41 4	28.606950128477667	-81.51522648528359	Orchard Park Dr		Sidewalk along Roadway	Medium	Tree Roots
154	4/9/2024 17:51 4	28.608061625234726	-81.51411253741604	Orchard Park Dr	1891 Orchard Park Drive	Sidewalk along Roadway	Medium	Tree Roots
155	4/17/2024 13:24 20	28.56155887412766	-81.50990113390844	Red Gold Ln	9007 Red Gold Lane	Sidewalk along Roadway	Medium	Tree Roots
156	4/17/2024 13:27 20	28.561599459818513	-81.51003388386187	Red Gold Ln	9007 Red Gold Lane	Sidewalk along Roadway	Medium	Tree Roots
157	4/17/2024 13:30 20	28.56155814766552	-81.5103299402143	Red Gold Ln	9013 Red Gold Lane	Sidewalk along Roadway	Medium	Cracks
158	4/17/2024 13:32 20	28.56156822599607	-81.51078599690261	Red Gold Ln	9025 Red Gold Lane	Sidewalk along Roadway	Medium	Tree Roots
159	4/17/2024 13:36 20	28.561466882483565	-81.51090110270756	Red Gold Ln	9024 Red Gold Lane	Sidewalk along Roadway	Medium	Tree Roots
160	4/17/2024 13:40 20	28.561462010253848	-81.51065557390801	Red Gold Ln	9018 Red Gold Lane	Sidewalk along Roadway	Medium	Tree Roots
161	4/17/2024 13:42 20	28.5614785657721	-81.51047652225677	Red Gold Ln	9012 Red Gold Lane	Sidewalk along Roadway	Medium	Tree Roots
162	4/17/2024 14:27 20	28.56153753691352	-81.51116530446406	Pristine Cir	9102 Pristine Circle	Sidewalk along Roadway	Medium	Cracks
163	4/17/2024 14:36 20	28.562251294938562	-81.51258789347824	Pristine Cir	9153 Pristine Circle	Sidewalk along Roadway	Medium	Tree Roots
164	4/17/2024 14:31 20	28.56149119051101	-81.51118082070934	Pristine Cir	9138 Pristine Circle	Sidewalk along Roadway	Medium	Tree Roots
165	4/17/2024 14:40 20	28.562226117952243	-81.51259170004865	Pristine Cir	9153 Pristine Circle	Sidewalk along Roadway	Medium	Cracks
166	4/17/2024 14:42 20	28.56221380904013	-81.51172087673143	Pristine Cir	9165 Pristine Circle	Sidewalk along Roadway	Medium	Cracks
167	4/17/2024 14:42 20	28.562324642993232	-81.5118119606168	Pristine Cir	9166 Pristine Circle	Sidewalk along Roadway	Medium	Tree Roots
168	4/17/2024 16:56 20	28.560723007508976	-81.50973348655117	Red Dandy Dr	1272 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
169	4/17/2024 16:58 20	28.560675063935506	-81.5097522435348	Red Dandy Dr	1271 Red Dandy Drive	Sidewalk along Roadway	Medium	Cracks
170	4/17/2024 17:01 20	28.560684389758745	-81.51018691543884	Red Dandy Dr	1253 Red Dandy Drive	Sidewalk along Roadway	Medium	Cracks
171	4/17/2024 17:03 20	28.56068024611674	-81.51040611371695	Red Dandy Dr	1253 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
172	4/17/2024 17:06 20	28.560796503210867	-81.51110909816607	Red Dandy Dr	1242 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
173	4/17/2024 17:08 20	28.5606527898481	-81.5111770409603	Red Dandy Dr	1241 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
174	4/17/2024 17:11 20	28.560655886855496	-81.511524199763	Red Dandy Dr	1235 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
175	4/17/2024 17:13 20	28.56065012235127	-81.51183605819935	Red Dandy Dr	1229 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
176	4/17/2024 17:20 20	28.56080840234254	-81.51249663199371	Red Dandy Dr	1212 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
177	4/17/2024 17:22 20	28.560643743239584	-81.51255660721428	Red Dandy Dr	1211 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
178	4/17/2024 17:24 20	28.560601612940395	-81.51264820402757	Red Dandy Dr	1211 Red Dandy Drive	Sidewalk along Roadway	Medium	Cracks
179	4/17/2024 17:25 20	28.560713342137955	-81.5127313128079	Red Dandy Dr	1148 Red Dandy Drive	Sidewalk along Roadway	Medium	Cracks
180	4/17/2024 17:29 20	28.56019722620461	-81.51269341329848	Climbing Rose Dr	1104 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
181	4/17/2024 17:32 20	28.5600498490763	-81.51269219600614	Climbing Rose Dr	1103 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
182	4/17/2024 17:35 20	28.559964240225924	-81.51282293945268	Red Dandy Dr	1118 Red Dandy Drive	Sidewalk along Roadway	Medium	Tree Roots
183	4/17/2024 17:42 20	28.55996052176687	-81.5101121457854	Climbing Rose Dr	1141 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
184	4/17/2024 17:43 20	28.5599082903875	-81.51015189345817	Climbing Rose Dr	1141 Climbing Rose Drive	Sidewalk along Roadway	Medium	Buckling
185	4/17/2024 17:45 20	28.55995613963786	-81.5101134926846	Climbing Rose Dr	1217 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
186	4/17/2024 17:51 20	28.559974686048207	-81.51118078464741	Climbing Rose Dr	1125 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
187	4/17/2024 17:54 20	28.560007955275324	-81.51108160200309	Climbing Rose Dr	1124 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots
188	4/17/2024 17:57 20	28.56003070799852	-81.5118595621182	Climbing Rose Dr	1116 Climbing Rose Drive	Sidewalk along Roadway	Medium	Tree Roots

Description of other cause of Damage	Sidewalk Length	Sidewalk Width	Sidewalk Depth	Repair Cost	Estimated Sidewalk Repair in		Estimated Sidewalk Repair in		x	y	Status
					Sq.Ft.	Repair in	Cu.Yd.				
So I wash being lifted due to large oak tree on private property. Sidewalk is lifted close to an inch on one side and cracked on the other side at the joint.	21	4	4	8	84		336	-81.5105	28.56226		
	7	4	4	8	28		112	-81.5107	28.56221		
Contractor needs to remove sidewall and remove all routes underneath sidewalk and replace sidewalk back level and at grade.	35	4	4	8	140		560	-81.5103	28.56229		
Small sections broke off on four different panels in front of this address. Please remove and replace back to meet existing sidewalk at grade	9	4	4	8	36		144	-81.5099	28.56237		
There are 4 sections, causing trip hazards at this location	22	4	4	8	88		352	-81.5325	28.58236		
Sidewalk appears to be crushed from being driven over by heavy equipment.	26	4	6	8	104		624	-81.5097	28.58336		
Looks like the sidewalk has settled at this location And has dropped about an inch and a half	8	4	4	8	32		128	-81.5098	28.58344		
Sidewalk is lifted due to tree roots underneath. Contractor needs to remove the tree roots and place sidewalk back level and at grade.	17	4	4	8	68		272	-81.5391	28.5617		
Sidewalk is lifted due to tree roots. Contractor will need to remove sidewalk and any tree roots underneath it and plays sidewalk back at grade level so homeowner can match driveway to new sidewalk.	26	4	4	8	104		416	-81.5392	28.5616		
Sections of sidewalk through the driveway along with the apron have been lifted by tree roots and need to be removed along with any tree roots underneath. Contractor need to put everything back at grade and level so homeowner can do repairs to driveway.	10	4	6	8	40		240	-81.5391	28.56161		
Apron of driveway has been lifted and cracked due to tree roots underneath. Contractor needs to remove apron and remove any tree roots underneath. Replace apron back at original grade prior to damage from tree roots.	20	7	6	8	140		840	-81.5391	28.56161		
sections of sidewalk lifted due to tree roots. Two sections are lifted pretty good for other sections starting to lift. Contractor needs to remove sections of sidewalk and any roots underneath and replace sidewalk to match existing sidewalk.	30	5	4	8	150		600	-81.5216	28.57295		
Sideway is lifting due to tree roots. Remove all sections and roots underneath replace back level and at grade to match existing sidewalk and driveways.	73	4	4	8	292		1168	-81.5365	28.58778		
Sidewalk broke, do to tree roots, lifting sidewalk. Contractor needs to remove sections of sidewalk and place back level and at grade to match existing sidewalk.	18	4	6	8	72		432	-81.5366	28.5877		
Contractor needs to remove sections of sidewalk at this location and replace Bacot grade to match existing sidewalk and curb	9	7	6	8	63		378	-81.5337	28.56283		
Sections of sidewalk are cracked. Looks like due to poor construction. Contractor needs to remove replace Bacot grade matching existing sidewalk.	9	4	4	8	36		144	-81.5335	28.56284		
Contractor needs to remove sections of sidewalk lifted due to tree roots. Contractor needs replaced sections of sidewalks at grade to match existing sidewalk.	18	4	4	8	72		288	-81.5298	28.56274		
Few different sections of sidewalk have been driven over and broken and one section has a square pole missing	24	4	4	8	96		384	-81.5294	28.56275		
ADA ramp on the corner, looks to be broken due to vehicles driving over it	6	4	6	8	24		144	-81.5255	28.57774		
Majority of the sidewalk at this address is listed due to tree roots. There are a few sections that seem to be broken due to vehicles driving over it.	37	4	4	8	148		592	-81.5258	28.57778		
Sections of sidewalk broken due to being driven over.	10	4	5	8	40		200	-81.525	28.57768		
Sections of sidewalk lifted due to tree roots. Contractor needs to remove sidewalk and all tree roots below it then replace sidewalk back at grade to match existing sidewalk.	35	4	4	8	140		560	-81.5253	28.57774		
This section of sidewalk and part of the driveway apron are cracked due to for construction or tree roots underneath. Contractor, please remove mark sections and replace back to match existing concrete.	7	12	6	8	84		504	-81.5251	28.57776		

Sidewalk lifted due to large oak tree in homeowners property. Contractor, please remove sidewalk and any roots underneath to replace sidewalk back at grading level to match existing sidewalk.	25	4	4	8	100	400	-81.5251	28.57775
Sections of sidewalk through the driveway I've been lifted due to tree roots. Remove sections of sidewalk and any roots underneath to replace sidewalk back to match existing concrete.	15	4	6	8	60	360	-81.5249	28.57774
Homeowner expanded driveway, which in return, put the sections to the sidewalk where they will be driving over it. Please remove the sections and replace back at 6 inches.	10	4	6	8	40	240	-81.5246	28.57775
This section of sidewalk seems to be seen king. There are two water meters located within the sidewalk. I will work with Utilities to have these moved outside of the sidewalk.	6	4	4	8	24	96	-81.5246	28.57775
Sections of sidewalk are cracked and need replacing. Please remove the sections, replace level at grain to match existing concrete.	17	4	4	8	68	272	-81.5246	28.57777
Sidewalk is broken off due to poor construction	4	4	6	8	16	96	-81.5244	28.57775
Does ADA ramp has been driven over and cracked. Please replace to match existing concrete.	5	4	6	8	20	120	-81.5243	28.57776
Tree roots have lifted the sidewalk causing trip hazards. Contractor needs to remove lift and sections of sidewalk and replace Bacot grade to match existing sidewalk.	14	6	4	8	84	336	-81.5151	28.57408
Sidewalks is lifted due to tree roots underneath. Contractor needs to remove all sections of sidewalk and replace a grade to match existing sidewalk.	28	4	4	8	112	448	-81.5087	28.57977
Sections of sidewalk running through the driveway I've been lifted and cracked do the tree roots contractor need to remove sections and any tree roots underneath and replace back	9	4	6	8	36	216	-81.5087	28.5799
	66	4	4	8	264	1056	-81.5311	28.56747
The apron needs to be replaced	7	10	6	8	70	420	-81.5313	28.56745
	14	4	4	8	56	224	-81.5316	28.56725
	35	4	4	8	140	560	-81.5312	28.56738
	28	4	4	8	112	448	-81.5308	28.56738
	33	4	4	8	132	528	-81.5308	28.56765
	17	4	4	8	68	272	-81.531	28.56759
Sidewalk is lifted drastically due to tree roots underneath. Contractor needs to remove sidewalk panels and tree roots underneath replaced sidewalk back at grade to match.	22	4	4	8	88	352	-81.5138	28.56051
Trucks driving over sidewalk broken corner of South, Clark and White Road	15	8	4	8	120	480	-81.5172	28.56299
	40	5	4	8	200	800	-81.5173	28.56305
	21	4	4	8	84	336	-81.5278	28.56705
	22	4	4	8	88	352	-81.5278	28.56712
	20	4	4	8	80	320	-81.5281	28.56734
	23	4	4	8	92	368	-81.5281	28.56725
Sidewalk is lifted, do the tree roots. Contractor needs to remove sidewalk and any tree roots underneath and replace sidewalk back at grade level to match existing sidewalk.	30	4	4	8	120	480	-81.5213	28.574
Sidewalk appears to be broken from someone driving over it	7	4	4	8	28	112	-81.5353	28.58296
There are three sections located at this address two of which look like they have been driven over and cracked. There is another section next to a water meter that has already been removed. Please remove sections and replace everything back to match ext.	17	4	4	8	68	272	-81.535	28.58298
Sidewalk has been lifted due to tree roots underneath. Remove sections of sidewalk, remove route and replace sidewalk back at grade to match existing sidewalk.	19	4	4	8	76	304	-81.5216	28.57439
Sidewalk has been lifted and cracked due to tree roots. Please remove damage, sidewalk and tree roots underneath replaced back at grade to match existing sidewalk.	15	4	4	8	60	240	-81.5215	28.57446
Sidewalk has been lifted due to tree roots. Please remove sidewalk and tree roots underneath replace back at grade to match existing sidewalk.	25	4	4	8	100	400	-81.5216	28.57457
The corner of the ADA ramp has been snapped off due to being driven over	3	4	6	8	12	72	-81.5216	28.57508
Sidewalk has been lifted due to tree roots	162	4	4	8	648	2592	-81.5216	28.57488

The sidewalk is lifted due to tree roots. Remove all lifted sections and root underneath. Replace sidewalk back at grade to match existing sidewalk	25	4	4	8	100	400	-81.5421	28.58367
Sidewalks are lifted due to tree roots underneath. Remove lifted sections of sidewalk and Root underneath replace back at grade to match existing sidewalk	28	4	4	8	112	448	-81.542	28.58358
Sidewalk is lifted due to tree roots. Please remove lifted sections and tree roots underneath replace back at grade to match existing sidewalk.	19	4	4	8	76	304	-81.5076	28.58261
Sidewalk has become lifted due to tree roots. Remove sections of sidewalk and tree roots underneath sidewalk, replace back at grade to match existing sidewalk.	65	4	4	8	260	1040	-81.5152	28.60695
Sidewalks have become lifted due to tree roots. Remove sections and roots underneath replaced back at grade to match existing sidewalks	17	4	4	8	68	272	-81.5141	28.60806
Tree roots	11	4	4	8	44	176	-81.5099	28.56156
	35	4	4	8	140	560	-81.51	28.5616
	16	4	4	8	64	256	-81.5103	28.56156
	25	4	4	8	100	400	-81.5108	28.56157
	20	4	4	8	80	320	-81.5109	28.56147
	7	4	4	8	28	112	-81.5107	28.56146
	13	4	4	8	52	208	-81.5105	28.56148
	17	4	4	8	68	272	-81.5112	28.56154
The sidewalk is on the side of the house, not in front	15	4	4	8	60	240	-81.5126	28.56225
	33	4	4	8	132	528	-81.5112	28.56149
	12	4	4	8	48	192	-81.5126	28.56223
	18	4	4	8	72	288	-81.5117	28.56221
	11	4	4	8	44	176	-81.5118	28.56232
	12	4	4	8	48	192	-81.5097	28.56072
	10	4	4	8	40	160	-81.5098	28.56068
	18	4	4	8	72	288	-81.5102	28.56068
	17	4	4	8	68	272	-81.5104	28.56068
	19	4	4	8	76	304	-81.5111	28.5608
	13	4	4	8	52	208	-81.5112	28.56065
	33	4	4	8	132	528	-81.5115	28.56066
	11	4	4	8	44	176	-81.5118	28.56065
	29	4	4	8	116	464	-81.5125	28.56081
	20	4	4	8	80	320	-81.5126	28.56064
Sidewalk on the side of the house	4	4	4	8	16	64	-81.5126	28.5606
	12	4	4	8	48	192	-81.5127	28.56071
	45	4	4	8	180	720	-81.5127	28.5602
	19	4	4	8	76	304	-81.5127	28.56005
	15	4	4	8	60	240	-81.5128	28.55996
	10	4	4	8	40	160	-81.5101	28.55996
	10	4	4	8	40	160	-81.5102	28.55991
	56	4	4	8	224	896	-81.5101	28.55996
	6	4	4	8	24	96	-81.5112	28.55997
	24	4	4	8	96	384	-81.5111	28.56001
	27	4	4	8	108	432	-81.5119	28.56003



American Persian Engineering & Construction LLC
5401 S. Kirkman Rd #336, Orlando, FL 327819
(407)6197888

05/06/2024

APEC takes Pride in every project and milestone completed. We strive to set a standard higher than the industry and are immensely proud to practice the best methodologies on providing the most efficient project management process.

OVERVIEW

We are pleased to provide you the below quote on the services requested on removal of existing sidewalk and installation of new sidewalk. This proposal has been prepared in conjunction with the list which was provided by your office and below is information of contract.

Contract : Piggyback Kissimmee IFB 2022-002 Alternative Paving Methods.

Project Name: City Wide Remove and Replace Sidewalk

No	Item	Description	Estimated Quantity	Unit of Measure	Quantity	Unit Price	Total Price
1	18	Miscellaneous Concrete Removal	1-200	SY	948.33	\$40.00	\$37,933.20
2	121	Concrete Sidewalk-(4" thickness)	1-100	SY	857.11	\$100.00	\$85,711.00
3	124	Concrete Sidewalk-(6" thickness)	1-100	SY	91.22	\$120.00	\$10,946.40
						Total	\$134,590.60
4	1	Mobalization	1	%	1	10%	\$13,459.06
5	3	Maintenance of Traffic	1	%	1	10%	\$13,459.06
						Grand Total	\$161,508.72

Sincerely

Arman PourMirza, PMP

Street Name	Full Address	Cause of Damage	Length	Width	Depth	Area 4"	Area 6"	Phase
Climbing Rose Dr	1262 Climbing Rose Drive	Tree Roots	21	4	4	84		#1
Climbing Rose Dr	1262 Climbing Rose Drive	Buckling	7	4	4	28		#1
Climbing Rose Dr	1258 Climbing Rose Drive	Tree Roots	35	4	4	140		#1
Climbing Rose Dr	1253 Climbing Rose Drive	Other	9	4	4	36		#1
Neumann Village Ct	661 Neumann Village Court	Tree Roots	22	4	4	88		#1
Red Gold Ln	9007 Red Gold Lane	Tree Roots	11	4	4	44		#1
Red Gold Ln	9007 Red Gold Lane	Tree Roots	35	4	4	140		#1
Red Gold Ln	9013 Red Gold Lane	Cracks	16	4	4	64		#1
Red Gold Ln	9025 Red Gold Lane	Tree Roots	25	4	4	100		#1
Red Gold Ln	9024 Red Gold Lane	Tree Roots	20	4	4	80		#1
Red Gold Ln	9018 Red Gold Lane	Tree Roots	7	4	4	28		#1
Red Gold Ln	9012 Red Gold Lane	Tree Roots	13	4	4	52		#1
Pristine Cir	9102 Pristine Circle	Cracks	17	4	4	68		#1
Pristine Cir	9153 Pristine Circle	Tree Roots	15	4	4	60		#1
Pristine Cir	9138 Pristine Circle	Tree Roots	33	4	4	132		#1
Pristine Cir	9153 Pristine Circle	Cracks	12	4	4	48		#1
Pristine Cir	9165 Pristine Circle	Cracks	18	4	4	72		#1
Pristine Cir	9166 Pristine Circle	Tree Roots	11	4	4	44		#1
Red Dandy Dr	1272 Red Dandy Drive	Tree Roots	12	4	4	48		#1
Red Dandy Dr	1271 Red Dandy Drive	Cracks	10	4	4	40		#1
Red Dandy Dr	1253 Red Dandy Drive	Cracks	18	4	4	72		#1
Red Dandy Dr	1253 Red Dandy Drive	Tree Roots	17	4	4	68		#1
Red Dandy Dr	1242 Red Dandy Drive	Tree Roots	19	4	4	76		#1
Red Dandy Dr	1241 Red Dandy Drive	Tree Roots	13	4	4	52		#1
Red Dandy Dr	1235 Red Dandy Drive	Tree Roots	33	4	4	132		#1
Red Dandy Dr	1229 Red Dandy Drive	Tree Roots	11	4	4	44		#1
Red Dandy Dr	1212 Red Dandy Drive	Tree Roots	29	4	4	116		#1
Red Dandy Dr	1211 Red Dandy Drive	Tree Roots	20	4	4	80		#1
Red Dandy Dr	1211 Red Dandy Drive	Cracks	4	4	4	16		#1
Red Dandy Dr	1148 Red Dandy Drive	Cracks	12	4	4	48		#1
Red Dandy Dr	1118 Red Dandy Drive	Tree Roots	15	4	4	60		#1
Climbing Rose Dr	1104 Climbing Rose Drive	Tree Roots	45	4	4	180		#1
Climbing Rose Dr	1103 Climbing Rose Drive	Tree Roots	19	4	4	76		#1
Climbing Rose Dr	1141 Climbing Rose Drive	Tree Roots	10	4	4	40		#1
Climbing Rose Dr	1141 Climbing Rose Drive	Buckling	10	4	4	40		#1
Climbing Rose Dr	1217 Climbing Rose Drive	Tree Roots	56	4	4	224		#1
Climbing Rose Dr	1125 Climbing Rose Drive	Tree Roots	6	4	4	24		#1
Climbing Rose Dr	1124 Climbing Rose Drive	Tree Roots	24	4	4	96		#1
Climbing Rose Dr	1116 Climbing Rose Drive	Tree Roots	27	4	4	108		#1
S Clarke Rd	Northeast corner at Clarke and White Rd	Driven Over	15	8	4	120		#1
S Clarke Rd	Northeast corner at Clarke and White Rd	Driven Over	40	5	4	200		#1
Lochshyre Loop	1883 Lochshyre Loop	Driven Over	26	4	6		104	#2
Lochshyre Loop	1889 Lochshyre Loop	Other	8	4	4	32		#2
Springfield Dr	2700 Springfield Drive	Tree Roots	28	4	4	112		#2
Springfield Dr	2700 Springfield Drive	Tree Roots	9	4	6		36	#2
E H Pounds Dr	2252 E H Pounds Drive	Tree Roots	19	4	4	76		#2
Orchard Park Dr	1891 Orchard Park Drive	Tree Roots	17	4	4	68		#2
Orchard Park Dr	Orchard Park Dr	Tree Roots	65	4	4	260		#2
Wurst Rd	462 Wurst Road	Tree Roots	73	4	4	292		#3
Wurst Rd	462 Wurst Road	Tree Roots	18	4	6		72	#3
Russell Dr	1244 Russell Drive	Driven Over	22	4	4	88		#3
Wanda St	1400 Wanda Street	Driven Over	6	4	6		24	#3
Wanda St	1400 Wanda Street	Tree Roots	37	4	4	148		#3
Wanda St	1402 Wanda Street	Driven Over	10	4	6		40	#3
Wanda St	1404 Wanda Street	Tree Roots	35	4	4	140		#3
Wanda St	1404 Wanda Street	Poor Construction	7	12	6		84	#3
Wanda St	1406 Wanda Street	Tree Roots	25	4	4	100		#3
Wanda St	1406 Wanda Street	Tree Roots	15	4	6		60	#3
Wanda St	1408 Wanda Street	Driven Over	10	4	6		40	#3
Wanda St	1408 Wanda Street	Poor Construction	6	4	4	24		#3
Wanda St	1410 Wanda Street	Poor Construction	17	4	4	68		#3
Wanda St	1410 Wanda Street	Poor Construction	4	4	6		16	#3
Wanda St	1410 Wanda Street	Driven Over	5	4	6		20	#3
Laurel Ridge Ave	111 Laurel Ridge Avenue	Tree Roots	25	4	4	100		#3
Laurel Ridge Ave	115 Laurel Ridge Avenue	Tree Roots	28	4	4	112		#3
Little Spring Hill Dr	409 Little Spring Hill Drive	Driven Over	7	4	4	28		#3
Little Spring Hill Dr	411 Little Spring Hill Drive	Driven Over	17	4	4	68		#3
Silver Crest Blvd	Silver Crest Blvd	Tree Roots	30	4	4	120		#3
Silver Crest Blvd	Silver Crest Blvd	Tree Roots	19	4	4	76		#3
Silver Crest Blvd	Silver Crest Blvd	Tree Roots	15	4	4	60		#3
Silver Crest Blvd	Silver Crest Blvd	Tree Roots	25	4	4	100		#3
Silver Crest Blvd	Silver Crest Blvd	Driven Over	3	4	6		12	#3
Silver Crest Blvd	Silver Crest Blvd	Tree Roots	162	4	4	648		#3
Olympus Dr	Olympus Dr	Tree Roots	30	5	4	150		#3
Lake Ohio Rd	Northside of Silver Star	Tree Roots	14	6	4	84		#3
Bismark Ct	131 Bismark Court	Tree Roots	66	4	4	264		#4
Bismark Ct	147 Bismark Court	Tree Roots	7	10	6		70	#4
Bismark Ct	171 Bismark Court	Tree Roots	14	4	4	56		#4
Bismark Ct	122 Bismark Court	Tree Roots	35	4	4	140		#4
Bismark Ct	111 Bismark Court	Tree Roots	28	4	4	112		#4
Bismark Ct	119 Bismark Court	Tree Roots	33	4	4	132		#4
Bismark Ct	119 Bismark Court	Tree Roots	17	4	4	68		#4
Bandaras Ave	603 Bandaras Avenue	Tree Roots	17	4	4	68		#4
Bandaras Ave	605 Bandaras Avenue	Tree Roots	26	4	4	104		#4
Bandaras Ave	605 Bandaras Avenue	Tree Roots	10	4	6		40	#4
Bandaras Ave	605 Bandaras Avenue	Tree Roots	20	7	6		140	#4
Keaton Pkwy	Keaton Pkwy	Tree Roots	21	4	4	84		#4
Keaton Pkwy	Keaton Pkwy	Tree Roots	22	4	4	88		#4
Keaton Pkwy	Keaton Pkwy	Tree Roots	20	4	4	80		#4
Keaton Pkwy	Keaton Pkwy	Tree Roots	23	4	4	92		#4
E Orlando Ave	East of Prima Vista	Driven Over	9	7	6		63	#4
E Orlando Ave	East of Prima Vista	Poor Construction	9	4	4	36		#4
E Orlando Ave	East of Prima Vista	Tree Roots	18	4	4	72		#4
E Orlando Ave	East of Prima Vista	Other	24	4	4	96		#4
Total						SF 7714	821	
						SY 857.11	91.22	
Removal						SY	948.33	



CITY OF OCOEE
1 North Bluford Avenue
Ocoee, Florida 34761

This Change Order Requires Action by the City Commission

CONTRACTED SIDEWALK REPAIRS WITH APEC LLC
CHANGE ORDER NO. 1

DATE: _____ PURCHASE ORDER: 1429325

The following changes are hereby made to the CONTRACT DOCUMENTS.

Original CONTRACT PRICE	<u>\$103,744.56</u>
Current CONTRACT PRICE ADJUSTED by previous CHANGE ORDERS	<u>\$285,860.64</u>
Net Increase (Decrease) Resulting from this CHANGE ORDER	<u>\$182,116.08</u>
The current CONTRACT PRICE including this CHANGE ORDER	<u>\$285,860.64</u>
Original CONTRACT COMPLETION DATE:	<u>May 31, 2024</u>
Current CONTRACT COMPLETION DATE adjusted by previous CHANGE ORDERS	<u>May 31, 2024</u>
Net Increase Resulting from this CHANGE ORDER	<u>122 days</u>
Current CONTRACT COMPLETION DATE including this CHANGE ORDER	<u>September 30, 2024</u>

1 CONTRACTED SIDEWALK REPAIRS WITH APEC LLC, CHANGE ORDER NO. 1

CHANGES ORDERED:

I. REQUIRED CHANGES

Commission approved utilizing an existing competitively bid contract from the City of Kissimmee with APEC LLC in order to expedite the project. The initial quantity of sidewalk replacements issued was approximately 1,350 linear feet in order to start the project. Public works added approximately 450 additional linear feet of sidewalk due to field conditions required to harmonize the replacements at a cost of \$20,607.36. Public Works has identified approximately 1,925 additional linear feet of sidewalk for replacement that can be incorporated into the project at a cost of \$161,508.72.

II. JUSTIFICATION

The original project anticipated utilizing the full funded amount for sidewalk replacements in the City. The awarded quantities were to allow the contractor to begin replacing sidewalk in the City while additional areas were quantified for inclusion into the project.

III. NARRATIVE OF NEGOTIATIONS

Public Works utilized the existing competitively bid contract from 2022 in order to price the work. Public Work initiated the use of the contract due to the favorable pricing contained over more recently bid contracts for similar work.

IV. PAYMENT

In accordance with the contract and City Purchasing Code.

V. APPROVAL AND CHANGE AUTHORIZATION

The original project and funding allocation was established by issuance of a CITY purchase order, subject to the terms and conditions contained in the CITY's solicitation, Project Manual, Drawings, Specifications, and/or the CONTRACTOR's service and price proposal, which collectively form the terms of an agreement between the CITY and the CONTRACTOR for the performance of the Work. This proposed change to the agreement requires approval by the City Commission under the CITY's Purchasing Rules and Regulations and is consistent with any prior action by the City Commission to award the Work to the CONTRACTOR. It is expressly understood and agreed that the approval of the Change Order shall have no effect on the original agreement other than matters expressly provided herein.

CONTRACTOR acknowledges, by its execution and acceptance of this Change Order, that the adjustments in contract price and time shown hereon constitute full and complete compensation and satisfaction for all costs and modifications of performance time incurred by the CONTRACTOR as a result of this Change Order. No other claim for increased costs of performance or modifications of time will be granted by the CITY for the Work covered by this Change Order. The CONTRACTOR hereby waives and releases any further claims for cost or

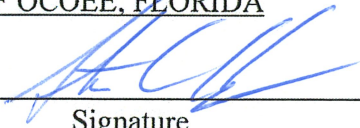
2 CONTRACTED SIDEWALK REPAIRS WITH APEC LLC, CHANGE ORDER NO. 1

time against the CITY arising from or relating to the matters or Work set forth or contemplated by this Change Order.

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RECOMMENDED BY:

CITY OF OCOEE, FLORIDA

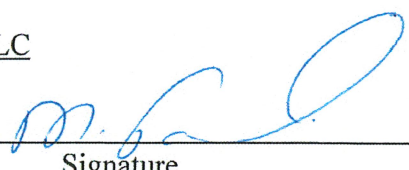
By: 
Signature

Date: 05-07-2024

Title: PUBLIC WORKS DIRECTOR

ACCEPTED BY:

APEC, LLC

By: 
Signature

Date: 05/07/24

Title: President

APPROVED BY:

CITY OF OCOEE, FLORIDA

By: _____
Rusty Johnson, Mayor

Date: _____

Attest: _____
Melanie Sibbitt, City Clerk

FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, APPROVED AS TO FORM
AND LEGALITY THIS _____ DAY OF
_____, 20____

APPROVED BY THE CITY OF OCOEE
COMMISSION IN A MEETING HELD ON
_____, 20____ UNDER
AGENDA ITEM NO. _____.

By: _____
City Attorney



STAFF REPORT

Meeting Date: May 21, 2024

Item #: 9

Contact Name: Vincent Ogburn
Contact Number: Ext. 3038

Department Director: Vincent Ogburn
City Manager: Robert Frank

Subject: First Reading of Ordinance to Implement Speed Enforcement Cameras in School Zones. (Police Chief Ogburn)

Background Summary:

In an effort to improve safety and compliance with the traffic laws in areas where children are present during school hours, HB 657 was enacted on July 1, 2023, by Governor Ron DeSantis. On Nov 7, 2023, the City Commission approved the renewal of its red-light camera vendor contract with Advanced Traffic Solutions, Inc. (ATS), doing business as Verra Mobility. The contract included the ability to provide school zone speed detection and enforcement via the installation of school zone enforcement cameras on roadways surrounding the schools. If the City Commission wishes to implement the program, or retain the ability to effectively do so in the future, an ordinance would need to be approved by the City Commission. The options to consider are to ratify the ordinance and allow it to remain an option to consider installing the system in the future or ratify the ordinance and move forward with the implementation of the program for one or more school zones.

Issue:

Should the Honorable Mayor and City Commissioners adopt an Ordinance to implement Speed Enforcement Cameras in school zones within the City?

Recommendations:

Staff recommends the Mayor and City Commissioners adopt an ordinance to implement speed zone enforcement cameras in the school zones within the City.

Attachments:

1. Ordinance

Financial Impacts:

There is no financial impact.

Type of Item: Regular

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA AMENDING CHAPTER 168 OF THE CODE OF ORDINANCES; DECLARING PURPOSE AND INTENT; AUTHORIZING PLACEMENT AND INSTALLATION OF SCHOOL ZONE SPEED DETECTION SYSTEMS; PROVIDING FOR IMPLEMENTATION OF GENERAL LAW BY THE CITY MANAGER AND DESIGNATION OF LOCAL HEARING OFFICER; PROVIDING FOR SEVERABILITY OF THE NEWLY CREATED SECTION; MAKING FINDINGS REGARDING RELEVANT TRAFFIC DATA AND EVIDENCE; WARRANTING ADDITIONAL ENFORCEMENT PROCEDURES AND DESIGNATING SCHOOL ZONE SPEED DETECTION SYSTEM LOCATIONS WHICH CONSTITUTE A HEIGHTENED SAFETY RISK; PROVIDING FOR SEVERABILITY; RATIFYING APPROVAL OF CONTRACT FOR IMPLEMENTING SCHOOL ZONE SPEED DETECTION SYSTEMS; PROVIDING FOR CODIFICATION; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Chapter 2023-174, Laws of Florida, enacted and signed by the Governor on May 21, 2023, effective July 1, 2023, amended Chapter 316, Florida Statutes, in regards to enforcement of school zone speed limits and authorized municipalities to enforce the speed limit in a school zone at specified periods through the use of a speed detection system; and

WHEREAS, to promote public safety, especially in regards to the safety of this jurisdiction's children, the City Commission of the City of Ocoee has decided to authorize the use of such a school zone speed limit detection system within the City; and

WHEREAS, the City Commission has considered the relevant traffic data and other evidence supporting the installation of school zone speed limit detection systems within the City; and

WHEREAS, the City Commission has determined, based upon the evidence considered, the location of the specific school zones in this jurisdiction which constitute a heightened safety risk that warrant additional enforcement procedures; and

WHEREAS, the City Commission has determined that it is efficient to utilize the City's existing local hearing officer appointed under § 168-13 of the Code of Ordinances to conduct hearings pursuant to this ordinance and Chapter 2023-174, Laws of Florida, as it may be amended; and

WHEREAS, the City Commission has determined that the public should have an opportunity to comment on the contract for school zone speed detection systems before the City Commission ratifies the approval of such contract in this Ordinance;

WHEREAS, the City Commission determines that the adoption of this Ordinance is in the best interest of the City.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

SECTION 1. Authority. The City Commission of the City of Ocoee has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapters 166 and 553, Florida Statutes.

SECTION 2. Amendment. Chapter 168, City of Ocoee Code of Ordinances, is amended to rename Article III and create a new § 15 to read as follows (words that are underlined indicate new language; words that are ~~stricken~~ are deletions; and all other provisions of the Chapter shall remain unchanged):

ARTICLE III – Traffic Light and School Zone Safety

§ 168-15 - SCHOOL ZONE SPEED LIMIT DETECTION SYSTEM, HEARINGS BEFORE A LOCAL HEARING OFFICER.

(A) Purpose and intent. The purpose of this section is to specifically authorize the use of a school zone speed limit detection system, as permitted by general law as of the effective date of this section, within the City's jurisdiction limits.

(B) Authorizing Use of School Zone Speed Limit Detection Systems. The City of Ocoee hereby exercises its option under Chapter 203-174, Laws of Florida (F.S. (2023) § 316.008) to use a speed limit detection system within its jurisdiction and to authorize a traffic infraction enforcement officer under F.S. (2023) § 316.1906 to issue a traffic citation of violation of F.S. (2023) §§ 316.1895 and 316.183 pursuant to § 316.1896. The City may utilize a speed limit detection system as a supplemental means of monitoring the speed of vehicles and assisting law enforcement personnel in the enforcement of compliance with laws related to speed limits within school zones as permitted and provided for by general law, which are designed to protect and improve the public health, safety, and welfare of the community and thereby reduce accidents, injuries, and disruption of traffic associated with such violations.

(C) Implementation of general law by the City Manager and designation of Local Hearing Officer. In accordance with the provisions of Chapter 203-174, Laws of Florida as of the effective date of this section, the City Manager is authorized to take all steps necessary to implement the provisions and requirements of Chapter 203-174, Laws of Florida, as it may be amended, within this jurisdiction in coordination with the Ocoee Police Department, including the designation of traffic infraction enforcement officers. The Ocoee Police Department shall be enabled by this section to oversee the School Zone Speed Limit Detection System program on behalf of the city. This ordinance shall further enable the City of Ocoee to enter into agreements or ratify agreements with vendors authorized to carry out services consistent with implementation and enforcement of the provisions of Chapter 203-174, Laws of Florida, as it may be amended. The Local Hearing Officer appointed under Section 168-13 of the Code of Ordinances shall preside over hearings requested pursuant to this section and Chapter 203-174, Laws of Florida, as it may be amended.

(D) Designation of School Zones. The City Commission finds that, based on the traffic data and other evidence of speeding motorists in the presence of children presented at the public hearing on this date of adoption, the school zones on the roadways surrounding the following schools constitute a heightened safety risk to children and others that warrants additional enforcement measures by installing or placing speed detection systems pursuant to section

316.008, Florida Statutes. Subsequent speed detection systems may be approved for inclusion or removal via amendment to this Ordinance or Resolution in accordance with applicable law.

- Citrus Elementary School 87 N. Clarke Road Ocoee, FL 34761
- Spring Lake Elementary 1105 Sarah Lee Lane Ocoee, FL 34761
- Ocoee Middle School 300 S. Bluford Avenue Ocoee, FL 34761
- Orlando Elementary 400 S. Lakewood Avenue Ocoee, FL 34761
- Ocoee High School 1925 Ocoee Crown Point Ocoee, FL 34761

SECTION 3. Ratification of Amendment to Agreement for School Zone Speed Detection Systems. The Commission hereby ratifies its approval of the Seventh Amendment to City of Ocoee Photo Enforcement Services Agreement: Red Light Safety Cameras, Fixed Speed Safety Cameras and Transportable Speed Safety Camera Systems with Enhanced Video and ALPR Solution Services, which would implement school zone speed enforcement devices, approved initially on the November 7, 2023 consent agenda.

SECTION 4. Severability. The provisions of this section are declared to be severable and if any section, sentence, clause, or phrase of this article shall for any reason be held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining sections, sentences, clauses and phrases of this article, but they shall remain in effect, it being the legislative intent that this section shall stand notwithstanding the invalidity of any part.

SECTION 5. Codification. It is the intention of the City Commission of the City that the provisions stated in this Ordinance shall become and be made a part of the Code of Ordinances of the City; and that sections of this Ordinance may be renumbered or relettered and the word "ordinance" may be changed to "chapter," "section," "article," or such other appropriate word or phrase in order to accomplish such intentions; and regardless of whether such inclusion in the Code is accomplished, sections of this Ordinance may be renumbered or relettered and the correction of typographical errors which do not affect the intent may be authorized by the City Manager, without need of public hearing, by filing a corrected or recodified copy of same with the City Clerk.

SECTION 6. Conflicting Ordinances. This ordinance shall prevail in the event of any inconsistency with another ordinance or part of an ordinance.

SECTION 7. Effective Date. This Ordinance shall become effective immediately upon passage and adoption.

PASSED AND ADOPTED this ____ day of _____, 2024.

APPROVED:

ATTEST:

CITY OF OCOEE, FLORIDA

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED
AS TO FORM AND LEGALITY**

this ____ day of _____, 2024.

FISHBACK DOMINICK

ADVERTISED _____, 2024

READ FIRST TIME _____, 2024;

READ SECOND TIME AND

ADOPTED _____, 2024

UNDER AGENDA ITEM NO. _____

By: _____

Richard S. Geller, City Attorney

STAFF REPORT

Meeting Date: May 21, 2024
Item #: 10

Contact Name: Michael Rumer
Contact Number: Ext. 1018

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Second Reading of Ordinances for 789 Pine Street Small-Scale Comprehensive Plan Amendment from Low-Density Residential (LDR) to Light Industrial (LI) & Rezoning from Single-Family Dwelling (R-1A) to Restricted Manufacturing & Warehousing (I-1); Project No. CPA-2024-002 & RZ-24-02-01. (Development Services Director Rumer)

Background Summary: First Reading of Ordinance held on May 7, 2024.

Owner/Applicant: Cotton Goodman Properties, LLC

General Location: The property is located in Commission District 3 and is located on the east side of Pine St., approximately 1,137 feet north of Palm Dr. at the intersection of Pine St.

Property Size and Parcel ID No.: The property contains approximately 2.51 acres and is assigned parcel identification number 18-22-28-0000-00-003.

Existing Site Conditions: The table below summarizes the existing conditions of the property.

Current Future Land Use (FLU) Map Designation	Current Zoning District	Existing Land Use	Overlays/Unique Features
Low Density Residential (Up to 4 units per acre) (Max: 4 lots)	R-1A	Existing Single-Family, wooded	Business Character Area Overlay District & Wekiva Study Area

The property is surrounded by the following: jurisdictions, Future Land Use Map designations, zoning districts and land uses.

Direction	Jurisdiction	FLUM Designation	Zoning District	Existing Land Use
North	Orange County	Low Density Residential	A-1	Single Family Dwelling
South	City	Low Density Residential	R-1A	Single Family Dwelling

East	City	Light Industrial	I-1	Restricted Manufacturing & Warehousing
West	City	Low Density Residential	A-2	Single Family Dwelling

Proposed Site Conditions: The table below summarizes the applicant's request and potential development on the subject property.

Proposed FLUM Designation	Proposed Zoning District	Proposed Use	Proposed Development Standards
Light Industrial	I-1 (Restricted Manufacturing & Warehousing)	Stormwater Pond/Light Industrial	LDC

Consistency with Florida Statutes: N/A

Consistency with JPA Agreement: N/A

Consistency with Adopted Comprehensive Plan: The property is located within the Downtown Redevelopment Area (DRA), which is intended to attract reinvestment in the downtown area of Ocoee through flexible development regulations and innovative designs. Development of the downtown should include mixed uses and various forms of residential uses.

Access: Access will be from the new east/west road being constructed by the developer of 450 Ocoee Apopka Road until such time when Pine Street designed and improved to City standards.

Utilities: Site will be served by Ocoee Water and Sewer.

Transportation: N/A Proposed stormwater pond.

Stormwater: Stormwater drainage will be provided on-site and will be finalized at the time of site plan review.

Schools: N/A

Public Safety: The property is currently within fire and police protection and service zones.

Issue:

Should the Honorable Mayor and City Commissioners approve the ordinances for a Small-Scale Comprehensive Plan Future Land Use Map Amendment from Low Density Residential (LDR) to Light Industrial (LI) and corresponding Rezoning from R-1A (Single Family Dwelling District) to I-1 (Restricted Manufacturing & Warehousing)?

Recommendations:

Development Review Committee (DRC) Recommendation:

The Development Review Committee (DRC) met on Tuesday, April 2, 2024, to consider the application for a Small-Scale Comprehensive Plan Future Land Use Map Amendment (CPA) and Rezoning to I-1. The DRC made a recommendation of approval.

Planning and Zoning Commission (PZC) Recommendation

The PZC met on Tuesday, April 9, 2024, to consider the Small-Scale Comprehensive Plan Future Land Use Map Amendment (CPA) and Rezoning to I-1. The PZC made a unanimous recommendation of approval.

Staff Recommendations:

Staff recommends that the Honorable Mayor and City Commissioners approve the ordinances for the Small-Scale Comprehensive Plan Future Land Use Map Amendment from Low Density Residential (LDR) to Light Industrial (LI) and corresponding Rezoning from R-1A (Single Family Dwelling District) to I-1 (Restricted Manufacturing & Warehousing).

Attachments:

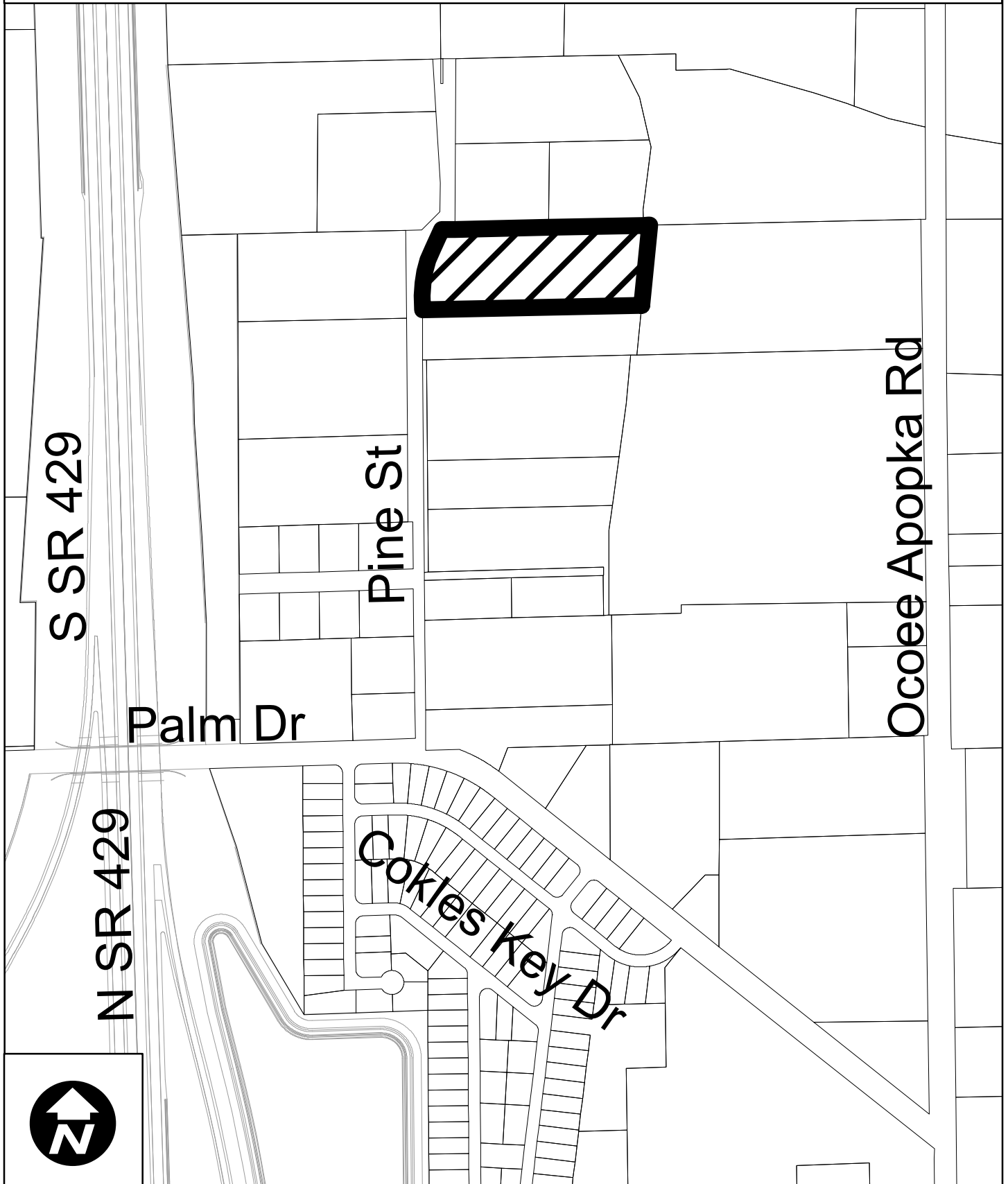
1. Location Map
2. Aerial Map
3. FLU Map
4. Surrounding Zoning Map
5. Small-Scale CPA Ordinance
6. Rezoning Ordinance
7. Small-Scale CPA Advertisement
8. Rezoning Advertisement

Financial Impacts:

No Financial Impacts

Type of Item: Second Reading Public Hearing

789 Pine Street Small-Scale CPA and Rezoning Location Map



789 Pine Street 2022 Aerial Photography



789 Pine Street CPA & Rezoning Surrounding Future Land Use Map



Ocoee
florida
Development Services
Department

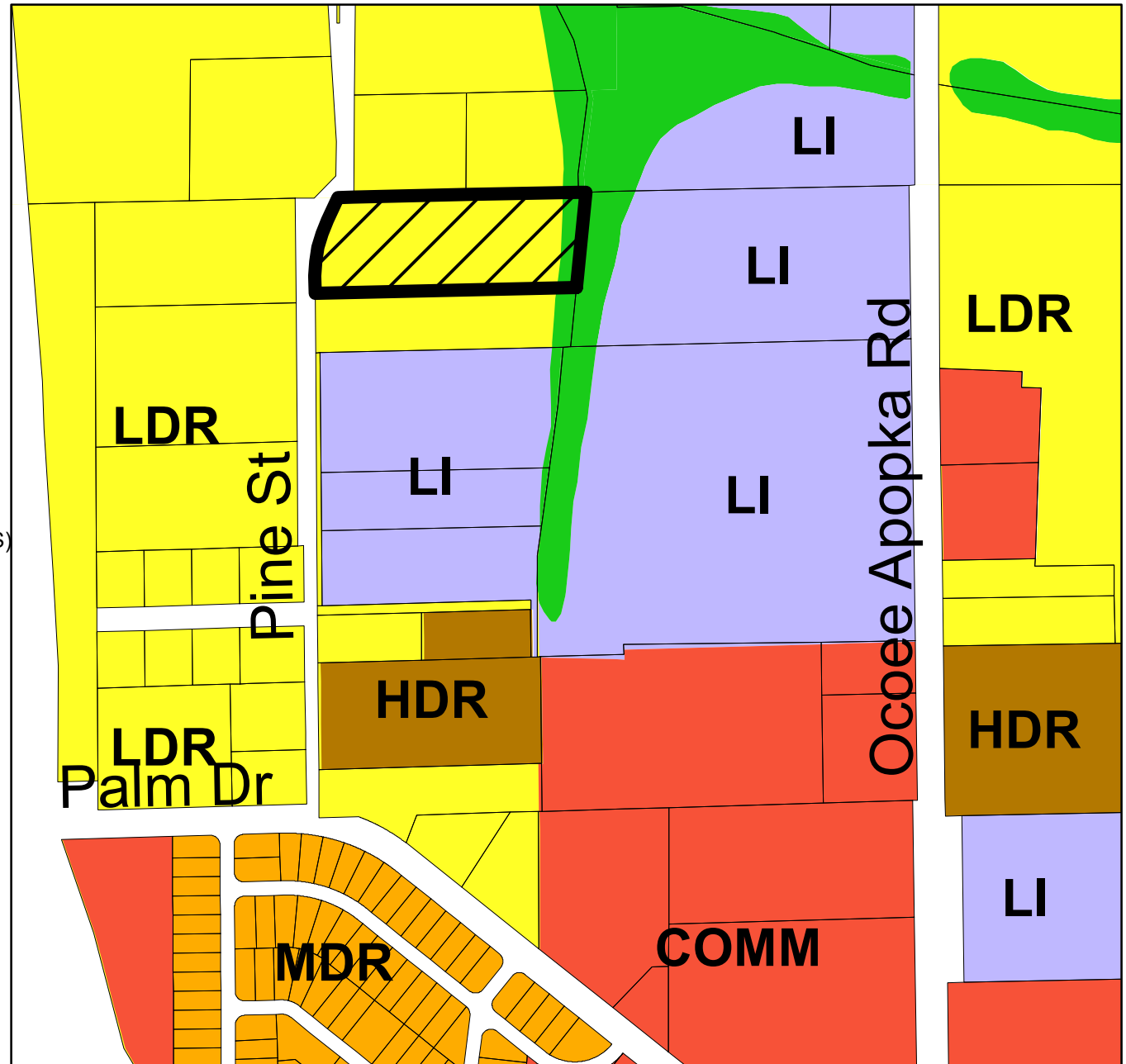
0 80 160 320
Feet

Created: month year

 Subject Property

Future Land Use Classification:

-  Low Density Residential (LDR)
-  Medium Density Residential (MDR)
-  High Density Residential (HDR)
-  Professional Offices and Services (PS)
-  Commercial (COMM)
-  Light Industrial (LI)
-  Heavy Industrial (HI)
-  Conservation/Floodplains (CONS)
-  Recreation and Open Space (REC)
-  Public Facilities/Institutional (INST)



789 Pine Street Surrounding Zoning Map



Development Services
Department

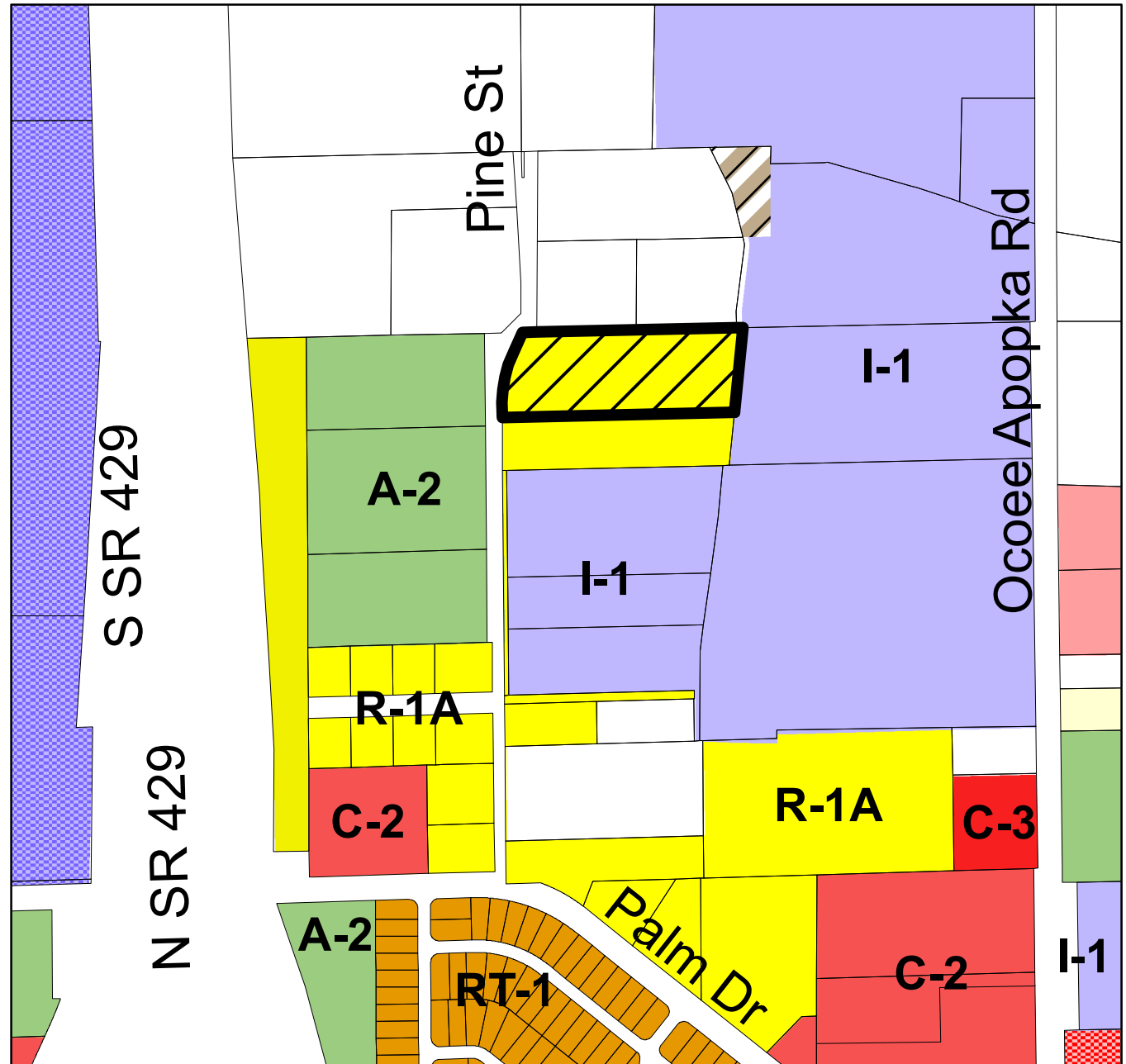
0 90 180 360
Feet

Created: month year

 Subject Property

Zoning Classification:

-  General Agricultural (A-1)
-  Suburban (A-2)
-  Single-Family Dwelling (R-1AAA)
-  Single-Family Dwelling (R-1AA)
-  Single-Family Dwelling (R-1A)
-  Single-Family Dwelling (R-1)
-  One- & Two-Family Dwelling (R-2)
-  Multiple-Family Dwelling (R-3)
-  Mobile Home Subdivision (RT-1)
-  Professional Offices & Services (P-S)
-  Neighborhood Shopping (C-1)
-  Community Commercial (C-2)
-  General Commercial (C-3)
-  Restricted Manufacturing & Warehousing (I-1)
-  General Industrial (I-2)
-  Commercial (PUD)
-  Low Density (PUD)
-  Medium Density (PUD)
-  High Density (PUD)
-  Public Use (PUD)
-  Unclassified



**ORDINANCE NO. 2024-
(Small-Scale Comprehensive Plan Amendment – 789 Pine Street)**

TAX PARCEL ID: 18-22-28-0000-00-003

CASE NO. CPA-2024-002: 789 Pine Street Small-Scale Comprehensive Plan Amendment

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, AMENDING THE CITY OF OCOEE COMPREHENSIVE PLAN AS ADOPTED IN 1991, AS AMENDED; AMENDING THE FUTURE LAND USE MAP OF THE OCOEE COMPREHENSIVE PLAN TO CHANGE THE FUTURE LAND USE MAP DESIGNATION FROM LOW DENSITY RESIDENTIAL TO LIGHT INDUSTRIAL FOR CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 2.51 ACRES LOCATED AT 789 PINE STREET ON THE EAST SIDE OF PINE STREET, APPROXIMATELY 1,137 FEET NORTH OF THE INTERSECTION OF PALM DRIVE AND PINE STREET; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY FUTURE LAND USE MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City Commission of the City of Ocoee (the “Ocoee City Commission”) has adopted the City’s Comprehensive Plan (the “Ocoee Comprehensive Plan”) by Ordinance No. 91-28 on September 18, 1991 pursuant to Chapter 163, Part II, Florida Statutes, the Growth Policy Act (the “Act”); and

WHEREAS, Chapter 163, Part II, Florida Statutes, sets forth procedures and requirements for a local government to adopt a comprehensive plan and amendments thereto; and

WHEREAS, the owner (the “Applicant”) of certain real property located within the corporate limits of the City of Ocoee, Florida, assigned tax parcel identification number 18-22-28-0000-00-003, more particularly described in Exhibit “A” and depicted in Exhibit “B”, has submitted an application to the Ocoee City Commission to amend the Comprehensive Plan Future Land Use designation (the “Comprehensive Plan Amendment”) of said real property from Low Density Residential to Light Industrial; and

WHEREAS, pursuant to Section 5-9(C) of Article V of the Land Development Code of the City of Ocoee, Florida, the Development Services Director has reviewed said Comprehensive Plan Amendment application and determined that said Comprehensive Plan Amendment is consistent with the Ocoee Comprehensive Plan, as amended from time to time; and

WHEREAS, pursuant to Section 163.3174(4)(a), Florida Statutes, the City’s Local Planning Agency (LPA) conducted a publicly noticed and advertised public hearing on Tuesday, April 9, 2024, to consider and make recommendation of said proposed Comprehensive Plan Amendment; and

WHEREAS, pursuant to Section 163.3184(11), Florida Statutes, on Tuesday, May 21, 2024, the Ocoee City Commission held a de novo advertised public hearing with respect to the proposed Comprehensive Plan Amendment and determined, after consideration of public comments, that the proposed Comprehensive Plan Amendment is consistent with the Ocoee Comprehensive Plan.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

SECTION 1. RECITALS. The foregoing recitals are hereby ratified and confirmed as true and correct and incorporated herein by this reference.

SECTION 2. AUTHORITY. The City Commission of the City of Ocoee has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapters 163 and 166, Florida Statutes.

SECTION 3. COMPREHENSIVE PLAN AMENDMENT. The Future Land Use Map within the Future Land Use Element of the Ocoee Comprehensive Plan is hereby amended to change the future land use designation of the Subject Property, as particularly described in Exhibit “A” and depicted in Exhibit “B”, from Low Density Residential (LDR) to Light Industrial (LI).

SECTION 4. COMPREHENSIVE PLAN. The City Clerk is hereby authorized and directed to revise the adopted Future Land Use Map of the City of Ocoee in order to incorporate the Comprehensive Plan Amendment enacted by this Ordinance.

SECTION 5. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

SECTION 6. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

SECTION 7. EFFECTIVE DATE. This Ordinance shall become effective thirty-one (31) days after adoption, unless challenged prior to that date pursuant to Section 163.3187(5), Florida Statutes.

PASSED AND ADOPTED this _____ day of _____, 2024.

Space intentionally left blank

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**

this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTION

Parcel A:

BEGINNING 100 feet South of the Northwest corner of the following described property: the North half of the Northwest quarter of the Northeast quarter of the Northwest quarter of Section 18, Township 22 South, Range 28 East, Orange County, Florida, run thence South 100 feet, thence East 150 feet, thence North 100 feet, thence West 150 feet to the POINT OF BEGINNING.

ALSO

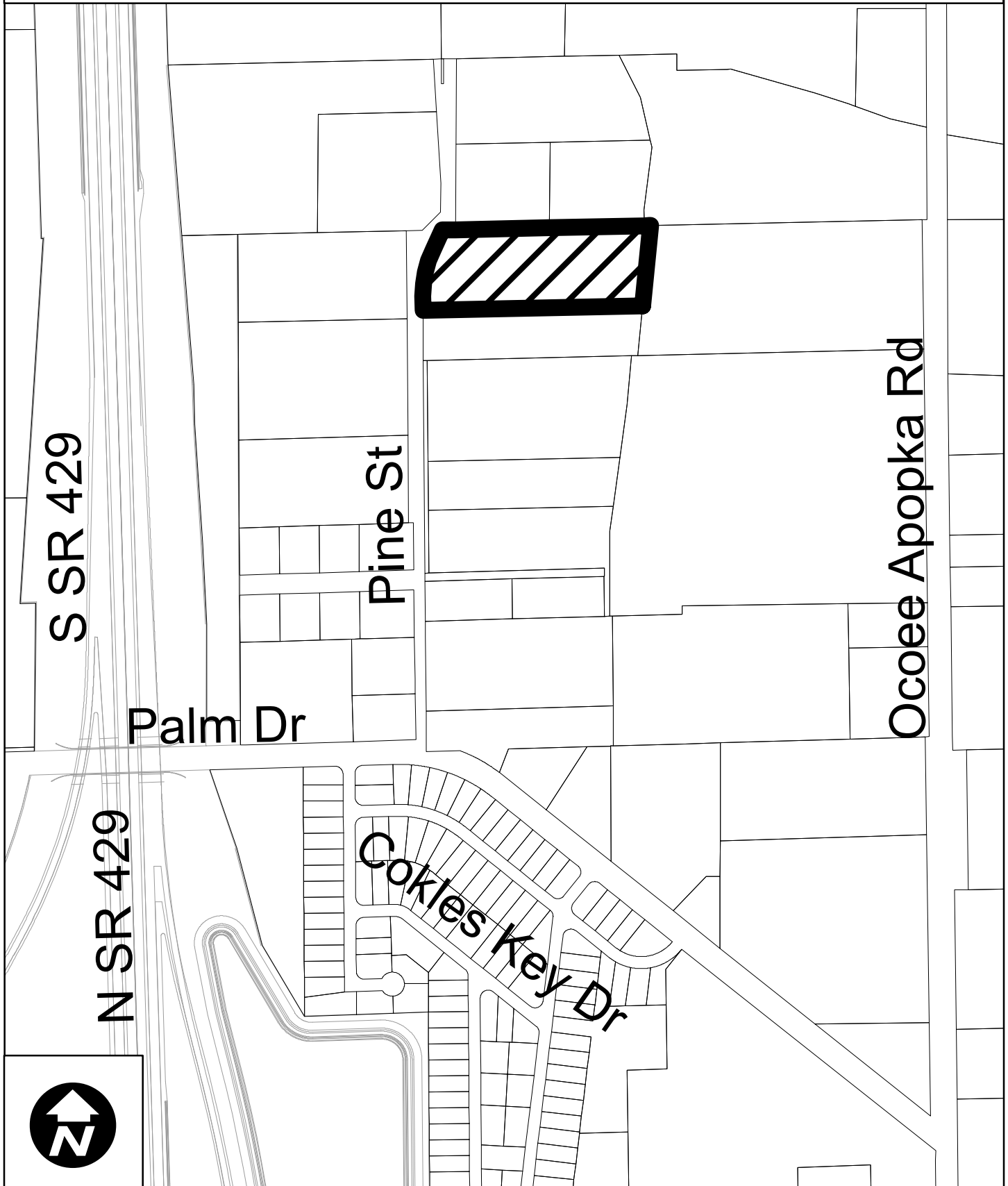
The South 100 feet of the North 200 feet, LESS the West 150 feet thereof, of the following described tract: the North half of the Northwest quarter of the Northeast quarter of the Northwest quarter of Section 18, Township 22 South, Range 28 east, LESS a tract across the East end 23 yards wide at the North end and 35 yards wide at the South end.

Parcel B:

The North 100 feet of the following described property: the North 1/2 of the Northwest 1/4 of the Northeast 1/4 of the Northwest 1/4 of Section 18, Township 22 South, Range 28 East, Orange County, Florida, LESS road right of way and LESS the following: the East end 23 yards wide at the North end and 35 yards wide at the South end.

PARCEL ID NO.: 18-22-28-0000-00-003

EXHIBIT "B"
LOCATION MAP - 789 PINE STREET



**ORDINANCE NO. 2024-
(Rezoning Ordinance – 789 Pine Street)**

TAX PARCEL ID: 18-22-28-0000-00-003

CASE NO. RZ-24-02-01: 789 Pine Street Rezoning

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, CHANGING THE ZONING CLASSIFICATION FROM R-1A (SINGLE FAMILY DWELLING DISTRICT) TO I-1 (LIGHT MANUFACTURING AND WAREHOUSING DISTRICT) ON CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 2.51 ACRES LOCATED AT 789 PINE STREET ON THE EAST SIDE OF PINE STREET, APPROXIMATELY 1,137 FEET NORTH OF THE INTERSECTION OF PALM DRIVE AND PINE STREET; FINDING SUCH ZONING TO BE CONSISTENT WITH THE OCOEE COMPREHENSIVE PLAN; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY ZONING MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the owner (the “Applicant”) of certain real properties located within the corporate limits of the City of Ocoee, Florida, as hereinafter described, has submitted an application to the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to rezone said real property (the “Rezoning”); and

WHEREAS, the Applicant seeks to rezone certain real properties containing approximately 2.51 acres, more particularly described in **Exhibit “A”** attached hereto and by this reference made a part hereof, from R-1A (Single-Family Dwelling District) to I-1 (Light Manufacturing and Warehousing); and

WHEREAS, pursuant to Section 5-9(B) of Article V of the Land Development Code of the City of Ocoee, Florida (the “Ocoee City Code”), the City Development Services Director has reviewed said Rezoning application and determined that the Rezoning is consistent with the City of Ocoee Comprehensive Plan as set forth in Ordinance No. 91-28, adopted September 18, 1991, as amended (the “Ocoee Comprehensive Plan”); and

WHEREAS, said Rezoning application was scheduled for review and recommendation by the Planning and Zoning Commission of the City of Ocoee, Florida (the “Planning and Zoning Commission”), acting as the Local Planning Agency; and

WHEREAS, on April 9, 2024, the Planning and Zoning Commission held a public hearing and reviewed said Rezoning application for consistency with the Ocoee Comprehensive Plan and determined that the Rezoning is consistent with the Ocoee Comprehensive Plan and is in the best interest of the City, and recommended to the Ocoee City Commission that the zoning classification of said real property be rezoned as requested by the Applicant and that the Ocoee City Commission

find that the Rezoning requested by the Applicant to be consistent with the Ocoee Comprehensive Plan; and

WHEREAS, on May 21, 2024, the Ocoee City Commission held a de novo advertised public hearing with respect to the proposed Rezoning of said real property and determined that the Rezoning is consistent with the Ocoee Comprehensive Plan; and

WHEREAS, this Ordinance has been considered by the Ocoee City Commission in accordance with the procedures set forth in Section 166.041(3)(a), Florida Statutes.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

SECTION 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapters 163 and 166, Florida Statutes.

SECTION 2. REZONING. The zoning classification, as defined in the Ocoee City Code, of the Properties described in **Exhibit “A”** containing approximately 2.51 acres located within the corporate limits of the City of Ocoee, Florida, is hereby changed from R-1A (Single-Family Dwelling District) to I-1 (Light Manufacturing and Warehousing). A map of said land herein described which clearly shows the area of the Rezoning is attached hereto as **Exhibit “B”** and by this reference is made a part hereof.

SECTION 3. COMPREHENSIVE PLAN. The Ocoee City Commission hereby finds the Rezoning of the lands described in this Ordinance to be consistent with the Ocoee Comprehensive Plan.

SECTION 4. ZONING MAP. The City Clerk is hereby authorized and directed to revise the Official Zoning Map of the City of Ocoee in order to incorporate the Rezoning enacted by this Ordinance, and the Mayor and City Clerk are hereby authorized to execute said revised Official Zoning Map in accordance with the provisions of Section 5-1(G) of Article V of the Ocoee City Code.

SECTION 5. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

SECTION 6. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portion hereto.

SECTION 7. EFFECTIVE DATE. This Ordinance shall become effective ten (10) days after its passage and adoption.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTION

Parcel A:

BEGINNING 100 feet South of the Northwest corner of the following described property: the North half of the Northwest quarter of the Northeast quarter of the Northwest quarter of Section 18, Township 22 South, Range 28 East, Orange County, Florida, run thence South 100 feet, thence East 150 feet, thence North 100 feet, thence West 150 feet to the POINT OF BEGINNING.

ALSO

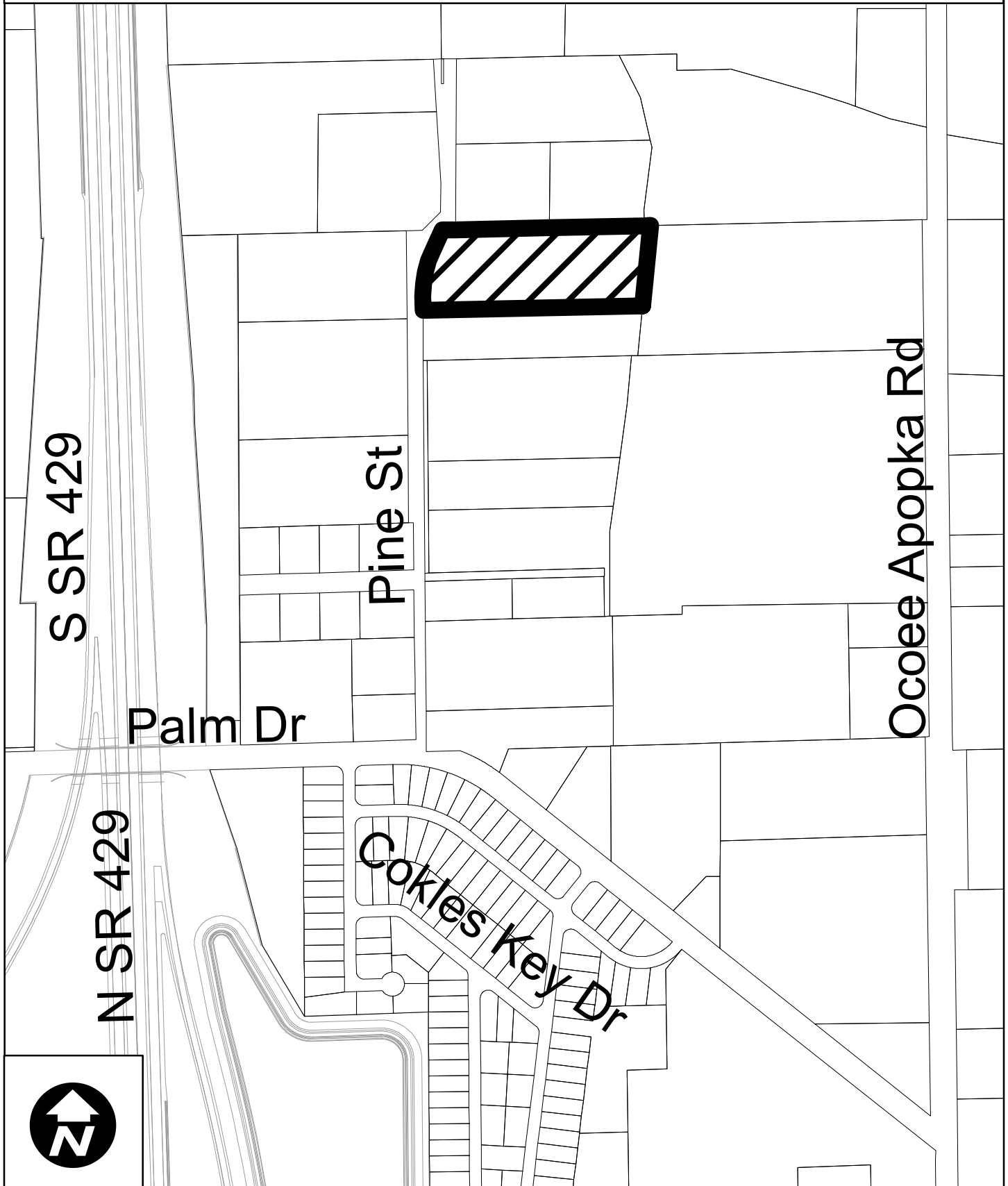
The South 100 feet of the North 200 feet, LESS the West 150 feet thereof, of the following described tract: the North half of the Northwest quarter of the Northeast quarter of the Northwest quarter of Section 18, Township 22 South, Range 28 east, LESS a tract across the East end 23 yards wide at the North end and 35 yards wide at the South end.

Parcel B:

The North 100 feet of the following described property: the North 1/2 of the Northwest 1/4 of the Northeast 1/4 of the Northwest 1/4 of Section 18, Township 22 South, Range 28 East, Orange County, Florida, LESS road right of way and LESS the following: the East end 23 yards wide at the North end and 35 yards wide at the South end.

PARCEL ID NO.: 18-22-28-0000-00-003

EXHIBIT "B"
LOCATION MAP - 789 PINE STREET



West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

**CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
789 PINE STREET
SMALL-SCALE COMPREHENSIVE PLAN AMENDMENT FROM LOW
DENSITY RESIDENTIAL (LDR) TO LIGHT INDUSTRIAL (LI)
CASE NUMBER: CPA-2024-002**

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-8, 1-9, and 1-10, and Article V, Section 5-9, of the City of Ocoee Land Development Code that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOOE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider a Small-Scale Comprehensive Plan Amendment from Low Density Residential (LDR) to Light Industrial (LI) for the 789 Pine Street. The property is assigned Parcel ID #18-22-28-0000-00-003 and consists of approximately 2.51 acres. The property is located on the east side of Pine St., approximately 1,137 feet north of Palm Dr. at the intersection of Pine St.

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, AMENDING THE CITY OF OCOEE COMPREHENSIVE PLAN AS ADOPTED IN 1991, AS AMENDED; AMENDING THE FUTURE LAND USE MAP OF THE OCOEE COMPREHENSIVE PLAN TO CHANGE THE FUTURE LAND USE MAP DESIGNATION FROM LOW DENSITY RESIDENTIAL TO LIGHT INDUSTRIAL FOR CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 2.51 ACRES LOCATED AT 789 PINE STREET ON THE EAST SIDE OF PINE STREET, APPROXIMATELY 1,137 FEET NORTH OF THE INTERSECTION OF PALM DRIVE AND PINE STREET; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY FUTURE LAND USE MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; PROVIDING FOR AN EFFECTIVE DATE.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 2024

24-01540W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.

West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
789 PINE STREET
REZONING FROM SINGLE-FAMILY DWELLING DISTRICT (R-1A) TO
LIGHT MANUFACTURING AND WAREHOUSING DISTRICT (I-1)
CASE NUMBER: RZ-24-02-01

NOTICE IS HEREBY GIVEN, pursuant to Article I, Section 1-10, and Article V, Section 5-9, of the City of Ocoee Land Development Code that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, changing the Zoning classification from Single-Family Dwelling District (R-1A) to Light Manufacturing and Warehousing District (I-1) for the 789 Pine Street. The property is assigned Parcel ID #18-22-28-0000-00-003 and consists of approximately 2.51 acres. The property is located on the east side of Pine St., approximately 1,137 feet north of Palm Dr. at the intersection of Pine St.

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, CHANGING THE ZONING CLASSIFICATION FROM R-1A (SINGLE FAMILY DWELLING DISTRICT) TO I-1 (LIGHT MANUFACTURING AND WAREHOUSING DISTRICT) ON CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 2.51 ACRES LOCATED AT 789 PINE STREET ON THE EAST SIDE OF PINE STREET, APPROXIMATELY 1,137 FEET NORTH OF THE INTERSECTION OF PALM DRIVE AND PINE STREET; FINDING SAID ZONING TO BE CONSISTENT WITH THE OCOEE COMPREHENSIVE PLAN; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY ZONING MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 2024

24-01541W

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STAFF REPORT

Meeting Date: May 21, 2024
Item #: 11

Contact Name: Michael Rumer
Contact Number: Ext. 1018

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Second Reading of Ordinance for 1 Taylor Street Small-Scale Comprehensive Plan FLU Amendment from Heavy Industrial (HI) to Commercial (COMM) & Rezoning from I-1 (Restricted Manufacturing and Warehousing) to C-2 (Community Commercial); Project Nos. CPA-2024-004 & RZ-24-03-02. (Development Services Director Rumer)

Background Summary: First Reading of Ordinance held on May 7, 2024.

Owner/Applicant: City of Ocoee

General Location: The property is located within Commission District 2 on the northeast side of the Taylor St. and W. McKey St. intersection.

Property Size and Parcel ID No.: The property contains approximately 0.21 acres and is assigned parcel identification number 18-22-28-0000-00-049.

Actual land use, proposed land use, and unique features of the subject property: 1 Taylor Street is located in the City's Downtown Redevelopment Area. The property was purchased by the City on January 15, 2024, which removed years of Code Violations. The City is proposing the Land Use Amendment and Rezoning in order to ensure the property entitlements remain only for commercial, office, retail and restaurant uses. These uses are in line with the vision and future planning of the City Downtown Master Plan. Therefore, removing the industrial zoning and land use designation ensures the parcel will meet the Master Plan in the future.

Existing Site Conditions: The table below summarizes the existing conditions of the property.

Current Future Land Use (FLU) Map Designation	Current Zoning District	Existing Land Use	Overlays/Unique Features
HI (Heavy Industrial)	I-1 (Restricted Manufacturing and Warehousing District)	Vacant	Downtown Redevelopment Area Overlay District & Wekiva Study Area

The property is surrounded by the following: jurisdictions, Future Land Use Map designations, zoning districts and land uses.

Direction	Jurisdiction	FLUM Designation	Zoning District	Existing Land Use
North	City	HI (Heavy Industrial)	I-2 (Heavy Industrial)	Warehousing, Outside Storage
South	City	LI (Light Industrial)	I-1 (Restricted Manufacturing and Warehousing)	Vacant
East	City	COMM (Commercial)	C-2 (Community Commercial)	Vacant
West	City	LI (Light Industrial)	I-1 (Restricted Manufacturing and Warehousing)	Restaurant/Vacant

Proposed Site Conditions: The table below summarizes the applicant's request and potential development on the subject property.

Proposed FLUM Designation	Proposed Zoning District	Proposed Use	Proposed Development Standards
COMM (Commercial)	C-2 (Community Commercial)	None	Downtown Master Plan

Consistency with Florida Statutes: Yes

Consistency with JPA Agreement: Yes

Consistency with Adopted Comprehensive Plan: The property is located within the Downtown Redevelopment Area (DRA), which is intended to attract reinvestment in the downtown area of Ocoee through flexible development regulations and innovative designs. Development of the downtown should include mixed uses and various forms of residential uses.

Access: Access will continue to be via Taylor Street.

Utilities: Potable Water Service is available, and sewer is being extended from the north on Oakland Avenue.

Transportation: N/A

Stormwater: N/A

Schools: N/A

Public Safety: N/A

Issue:

Should the Honorable Mayor and City Commissioners approve the ordinances for a Small-Scale Comprehensive Plan Future Land Use Map Amendment from Heavy Industrial (HI) to Commercial (COMM) and corresponding Rezoning from I-1 (Restricted Manufacturing and Warehousing District) to C-2 (Community Commercial District) for 1 Taylor Street?

Recommendations:**Development Review Committee (DRC) Recommendation:**

The Development Review Committee (DRC) met on Tuesday, April 2, 2024, to consider the application for a Small-Scale Comprehensive Plan Future Land Use Map Amendment (CPA) and Rezoning. The DRC made a recommendation of approval of the proposed Small Scale Comprehensive Plan Amendment from Heavy Industrial (HI) to Commercial (COMM) and corresponding Rezoning from I-1 (Restricted Manufacturing and Warehousing District) to C-2 (Community Commercial District).

Planning and Zoning Commission (PZC):

The PZC met on April 9, 2024, to consider the Small-Scale Comprehensive Plan Future Land Use Map Amendment (CPA) and Rezoning. The PZC made a unanimous decision to recommend approval of the ordinances for the proposed Small Scale Comprehensive Plan Amendment from Heavy Industrial (HI) to Commercial (COMM) and corresponding Rezoning from I-1 (Restricted Manufacturing and Warehousing District) to C-2 (Community Commercial District).

Staff Recommendations:

Staff recommends the Honorable Mayor and City Commissioners approve the ordinances for a Small-Scale Comprehensive Plan Future Land Use Map Amendment from Heavy Industrial (HI) to Commercial (COMM) and corresponding Rezoning from I-1 (Restricted Manufacturing and Warehousing District) to C-2 (Community Commercial District) for 1 Taylor Street.

Attachments:

1. Location Map
2. Aerial Map
3. Surrounding FLU Map
4. Surrounding Zoning Map
5. Small-Scale CPA Ordinance
6. Rezoning Ordinance
7. Small-Scale CPA Advertisement
8. Rezoning Advertisement

Financial Impacts:

None

Type of Item: Second Reading Public Hearing

1 Taylor Street CPA & Rezoning
Location Map



1 Taylor Street 2022 Aerial Photography



1 Taylor Street Surrounding Future Land Use Map



Development Services
Department

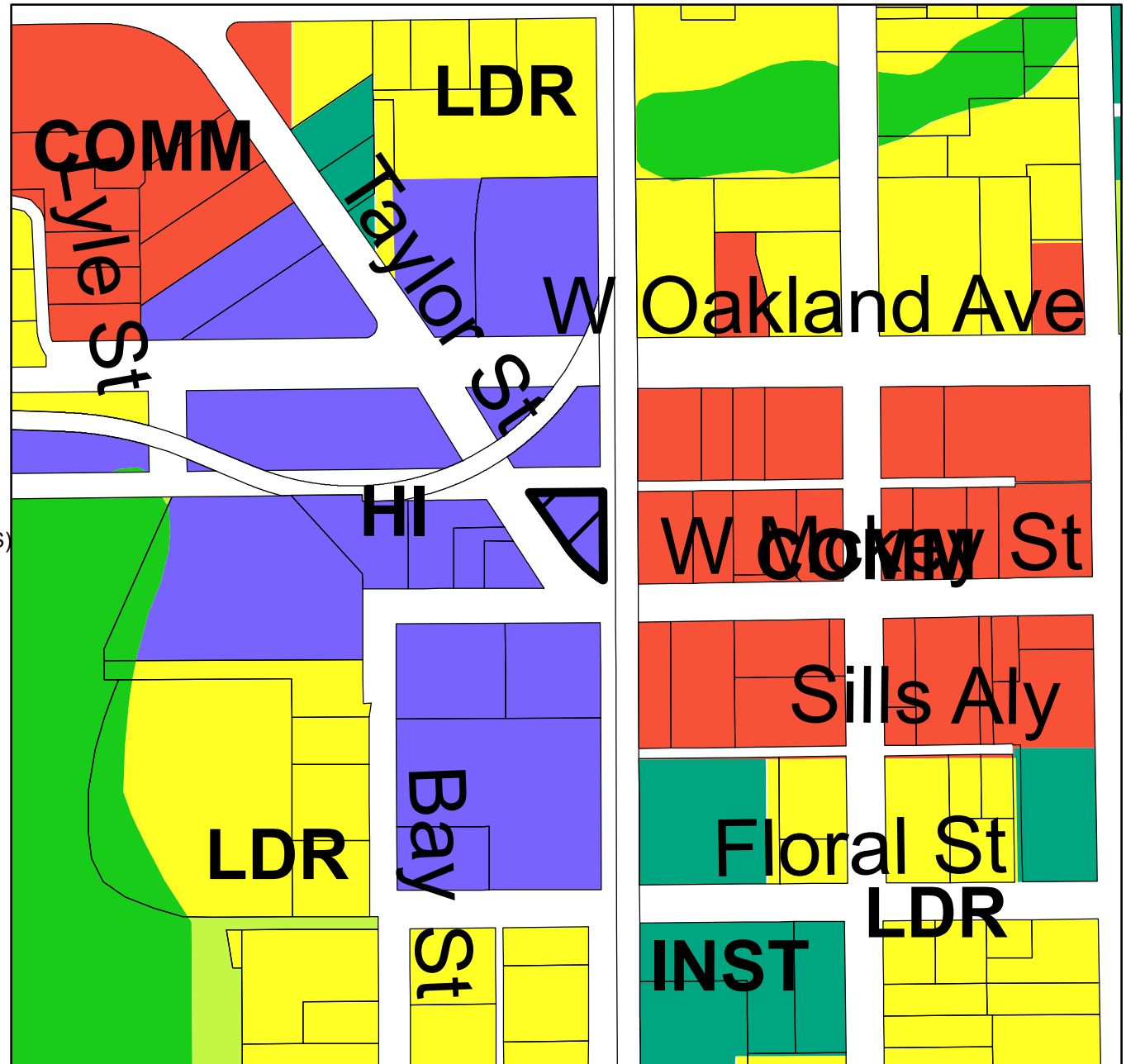
0 60 120 240
Feet

Created: month year

 Subject Property

Future Land Use Classification:

-  Low Density Residential (LDR)
-  Medium Density Residential (MDR)
-  High Density Residential (HDR)
-  Professional Offices and Services (PS)
-  Commercial (COMM)
-  Light Industrial (LI)
-  Heavy Industrial (HI)
-  Conservation/Floodplains (CONS)
-  Recreation and Open Space (REC)
-  Public Facilities/Institutional (INST)



1 Taylor Street Surrounding Zoning Map



Development Services
Department

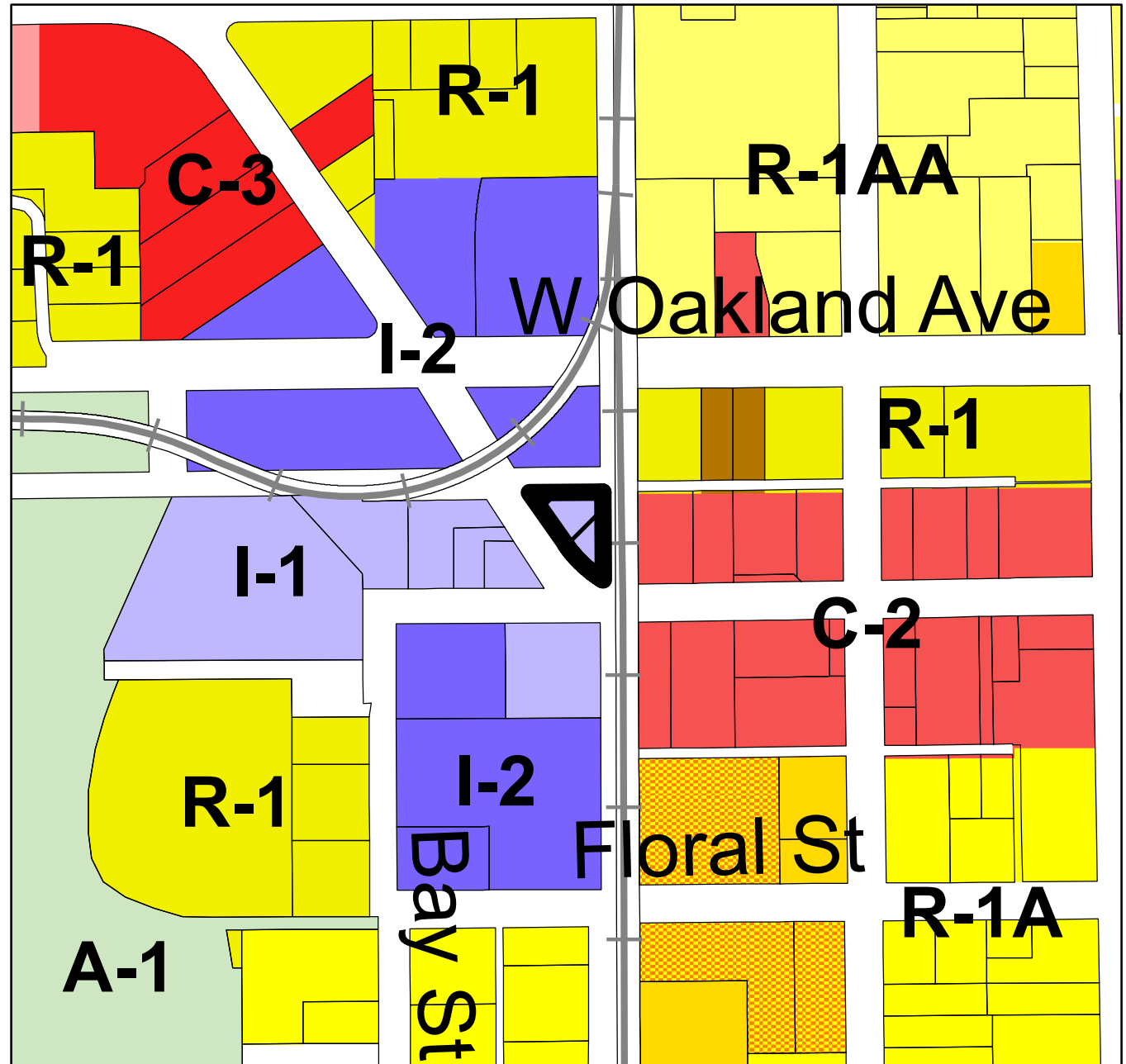
0 60 120 240
Feet

Created: month year

 Subject Property

Zoning Classification:

-  General Agricultural (A-1)
-  Suburban (A-2)
-  Single-Family Dwelling (R-1AAA)
-  Single-Family Dwelling (R-1AA)
-  Single-Family Dwelling (R-1A)
-  Single-Family Dwelling (R-1)
-  One- & Two-Family Dwelling (R-2)
-  Multiple-Family Dwelling (R-3)
-  Mobile Home Subdivision (RT-1)
-  Professional Offices & Services (P-S)
-  Neighborhood Shopping (C-1)
-  Community Commercial (C-2)
-  General Commercial (C-3)
-  Restricted Manufacturing & Warehousing (I-1)
-  General Industrial (I-2)
-  Commercial (PUD)
-  Low Density (PUD)
-  Medium Density (PUD)
-  High Density (PUD)
-  Public Use (PUD)
-  Unclassified



**ORDINANCE NO. 2024-
(Small-Scale Comprehensive Plan Amendment – 1 Taylor Street)**

TAX PARCEL ID: 18-22-28-0000-00-049

CASE NO. CPA-2024-004: 1 Taylor Street Small-Scale Comprehensive Plan Amendment

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, AMENDING THE CITY OF OCOEE COMPREHENSIVE PLAN AS ADOPTED IN 1991, AS AMENDED; AMENDING THE FUTURE LAND USE MAP OF THE OCOEE COMPREHENSIVE PLAN TO CHANGE THE FUTURE LAND USE MAP DESIGNATION FROM HEAVY INDUSTRIAL TO COMMERCIAL FOR CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 0.21 ACRES LOCATED AT 1 TAYLOR STREET ON THE NORTHEAST SIDE OF TAYLOR STREET, AT THE INTERSECTION OF TAYLOR STREET AND WEST MCKEY STREET; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY FUTURE LAND USE MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City Commission of the City of Ocoee (the “Ocoee City Commission”) has adopted the City’s Comprehensive Plan (the “Ocoee Comprehensive Plan”) by Ordinance No. 91-28 on September 18, 1991 pursuant to Chapter 163, Part II, Florida Statutes, the Growth Policy Act (the “Act”); and

WHEREAS, Chapter 163, Part II, Florida Statutes, sets forth procedures and requirements for a local government to adopt a comprehensive plan and amendments thereto; and

WHEREAS, the owner (the “Applicant”) of certain real property located within the corporate limits of the City of Ocoee, Florida, assigned tax parcel identification number 18-22-28-0000-00-049, more particularly described in Exhibit “A” and depicted in Exhibit “B”, has submitted an application to the Ocoee City Commission to amend the Comprehensive Plan Future Land Use designation (the “Comprehensive Plan Amendment”) of said real property from High Industrial to Commercial; and

WHEREAS, pursuant to Section 5-9(C) of Article V of the Land Development Code of the City of Ocoee, Florida, the Development Services Director has reviewed said Comprehensive Plan Amendment application and determined that said Comprehensive Plan Amendment is consistent with the Ocoee Comprehensive Plan, as amended from time to time; and

WHEREAS, pursuant to Section 163.3174(4)(a), Florida Statutes, the City’s Local Planning Agency (LPA) conducted a publicly noticed and advertised public hearing on Tuesday, April 9, 2024, to consider and make recommendation of said proposed Comprehensive Plan Amendment; and

WHEREAS, pursuant to Section 163.3184(11), Florida Statutes, on Tuesday, May 21, 2024, the Ocoee City Commission held a de novo advertised public hearing with respect to the proposed Comprehensive Plan Amendment and determined, after consideration of public comments, that the proposed Comprehensive Plan Amendment is consistent with the Ocoee Comprehensive Plan.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

SECTION 1. RECITALS. The foregoing recitals are hereby ratified and confirmed as true and correct and incorporated herein by this reference.

SECTION 2. AUTHORITY. The City Commission of the City of Ocoee has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapters 163 and 166, Florida Statutes.

SECTION 3. COMPREHENSIVE PLAN AMENDMENT. The Future Land Use Map within the Future Land Use Element of the Ocoee Comprehensive Plan is hereby amended to change the future land use designation of the Subject Property, as particularly described in Exhibit “A” and depicted in Exhibit “B”, from Heavy Industrial (HI) to Commercial (COMM).

SECTION 4. COMPREHENSIVE PLAN. The City Clerk is hereby authorized and directed to revise the adopted Future Land Use Map of the City of Ocoee in order to incorporate the Comprehensive Plan Amendment enacted by this Ordinance.

SECTION 5. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

SECTION 6. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

SECTION 7. EFFECTIVE DATE. This Ordinance shall become effective thirty-one (31) days after adoption, unless challenged prior to that date pursuant to Section 163.3187(5), Florida Statutes.

PASSED AND ADOPTED this _____ day of _____, 2024.

Space intentionally left blank

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**

this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTION

BEG NE COR OF SW1/4 OF SE1/4 RUN W 205 FT TO ROAD SELY ALONG ROAD TO POINTS S OF BEG
N TO POB IN SEC 18-22-28

PARCEL ID NO.: 18-22-28-0000-00-049

EXHIBIT "B"



**ORDINANCE NO. 2024-
(Rezoning Ordinance - 1 Taylor Street)**

TAX PARCEL ID: 18-22-28-0000-00-049

CASE NO. RZ-24-03-02: 1 Taylor Street Rezoning

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, CHANGING THE ZONING CLASSIFICATION FROM I-1 (LIGHT MANUFACTURING AND WAREHOUSING DISTRICT) TO C-2 (COMMUNITY COMMERCIAL DISTRICT) ON CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 0.21 ACRES LOCATED AT 1 TAYLOR STREET ON THE NORTHEAST SIDE OF TAYLOR STREET, AT THE INTERSECTION OF TAYLOR STREET AND WEST MCKEY STREET; FINDING SUCH ZONING TO BE CONSISTENT WITH THE OCOEE COMPREHENSIVE PLAN; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY ZONING MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the owner (the “Applicant”) of certain real properties located within the corporate limits of the City of Ocoee, Florida, as hereinafter described, has submitted an application to the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to rezone said real property (the “Rezoning”); and

WHEREAS, the Applicant seeks to rezone certain real properties containing approximately 0.21 acres, more particularly described in **Exhibit “A”** attached hereto and by this reference made a part hereof, from I-1 (Light Manufacturing and Warehousing District) to C-2 (Community Commercial District); and

WHEREAS, pursuant to Section 5-9(B) of Article V of the Land Development Code of the City of Ocoee, Florida (the “Ocoee City Code”), the City Development Services Director has reviewed said Rezoning application and determined that the Rezoning is consistent with the City of Ocoee Comprehensive Plan as set forth in Ordinance No. 91-28, adopted September 18, 1991, as amended (the “Ocoee Comprehensive Plan”); and

WHEREAS, said Rezoning application was scheduled for review and recommendation by the Planning and Zoning Commission of the City of Ocoee, Florida (the “Planning and Zoning Commission”), acting as the Local Planning Agency; and

WHEREAS, on April 9, 2024, the Planning and Zoning Commission held a public hearing and reviewed said Rezoning application for consistency with the Ocoee Comprehensive Plan and determined that the Rezoning is consistent with the Ocoee Comprehensive Plan and is in the best interest of the City, and recommended to the Ocoee City Commission that the zoning classification of said real property be rezoned as requested by the Applicant and that the Ocoee City Commission

find that the Rezoning requested by the Applicant to be consistent with the Ocoee Comprehensive Plan; and

WHEREAS, on May 21, 2024, the Ocoee City Commission held a de novo advertised public hearing with respect to the proposed Rezoning of said real property and determined that the Rezoning is consistent with the Ocoee Comprehensive Plan; and

WHEREAS, this Ordinance has been considered by the Ocoee City Commission in accordance with the procedures set forth in Section 166.041(3)(a), Florida Statutes.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

SECTION 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapters 163 and 166, Florida Statutes.

SECTION 2. REZONING. The zoning classification, as defined in the Ocoee City Code, of the Properties described in **Exhibit “A”** containing approximately 0.21 acres located within the corporate limits of the City of Ocoee, Florida, is hereby changed from I-1 (Light Manufacturing and Warehousing District) to C-2 (Community Commercial District). A map of said land herein described which clearly shows the area of the Rezoning is attached hereto as **Exhibit “B”** and by this reference is made a part hereof.

SECTION 3. COMPREHENSIVE PLAN. The Ocoee City Commission hereby finds the Rezoning of the lands described in this Ordinance to be consistent with the Ocoee Comprehensive Plan.

SECTION 4. ZONING MAP. The City Clerk is hereby authorized and directed to revise the Official Zoning Map of the City of Ocoee in order to incorporate the Rezoning enacted by this Ordinance, and the Mayor and City Clerk are hereby authorized to execute said revised Official Zoning Map in accordance with the provisions of Section 5-1(G) of Article V of the Ocoee City Code.

SECTION 5. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

SECTION 6. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

SECTION 7. EFFECTIVE DATE. This Ordinance shall become effective ten (10) days after its passage and adoption.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTION

BEG NE COR OF SW1/4 OF SE1/4 RUN W 205 FT TO ROAD SELY ALONG ROAD TO POINTS S OF BEG
N TO POB IN SEC 18-22-28

PARCEL ID NO.: 18-22-28-0000-00-049

EXHIBIT "B"



West Orange Times c/o Business Observer

1970 Main Street

3rd Floor

Sarasota, FL 34236

, 941-906-9386 x322

INVOICE

Legal Advertising

CITY OF OCOEE

NOTICE OF PUBLIC HEARING TO CONSIDER THE 1 TAYLOR STREET SMALL-SCALE COMPREHENSIVE PLAN FLU AMENDMENT FROM HEAVY INDUSTRIAL (HI) TO COMMERCIAL (COMM)

CASE NUMBER: CPA-2024-004

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-8, 1-9, and 1-10, and Article V, Section 5-9, of the City of Ocoee Land Development Code, that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider a Small-Scale Comprehensive Plan Amendment FLU Amendment from Heavy Industrial (HI) to Commercial (COMM) for 1 Taylor Street. The property is assigned Parcel ID #18-22-28-0000-00-049 and consists of approximately 0.21 acres. The property is located on the northeast side of Taylor Street, at the intersection of Taylor St. and W. Mckey St.

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, AMENDING THE CITY OF OCOEE COMPREHENSIVE PLAN AS ADOPTED IN 1991, AS AMENDED; AMENDING THE FUTURE LAND USE MAP OF THE OCOEE COMPREHENSIVE PLAN TO CHANGE THE FUTURE LAND USE MAP DESIGNATION FROM HEAVY INDUSTRIAL TO COMMERCIAL FOR CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 0.21 ACRES LOCATED AT 1 TAYLOR STREET ON THE NORTHEAST SIDE OF TAYLOR STREET, AT THE INTERSECTION OF TAYLOR STREET AND WEST MCKEY STREET; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY FUTURE LAND USE MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; PROVIDING FOR AN EFFECTIVE DATE.

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Melanie Sibbitt, City Clerk
May 9, 2024

24-01542W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.

West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

**CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
1 TAYLOR STREET
REZONING FROM RESTRICTED MANUFACTURING
AND WAREHOUSING DISTRICT (I-1)
TO COMMUNITY COMMERCIAL DISTRICT (C-2)
CASE NUMBER: RZ-24-03-02**

NOTICE IS HEREBY GIVEN, pursuant to Article I, Section 1-10, and Article V, Section 5-9, of the City of Ocoee Land Development Code that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, changing the zoning classification from Restricted Manufacturing and Warehousing District (I-1) to Community Commercial District (C-2) for 1 Taylor Street. The property is assigned Parcel ID #18-22-28-0000-00-049 and consists of approximately 0.21 acres. The property is located on the northeast side of Taylor Street, at the intersection of Taylor St. and W. McKey St.

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, CHANGING THE ZONING CLASSIFICATION FROM I-1 (RESTRICTED MANUFACTURING AND WAREHOUSING DISTRICT) TO C-2 (COMMUNITY COMMERCIAL DISTRICT) ON CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 0.21 ACRES LOCATED AT 1 TAYLOR STREET ON THE NORTHEAST SIDE OF TAYLOR STREET, AT THE INTERSECTION OF TAYLOR STREET AND WEST MCKEY STREET; FINDING SAID ZONING TO BE CONSISTENT WITH THE OCOEE COMPREHENSIVE PLAN; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY ZONING MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 2024

24-01543W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

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STAFF REPORT

Meeting Date: May 21, 2024
Item #: 12

Contact Name: Anoch Whitfield
Contact Number: Ext. 1016

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Second Reading of Ordinance for 1059 Ocoee Apopka Road - Rodgers Property Annexation; Project No. AX-03-24-03. (Zoning Manager Whitfield)

Background Summary: First Reading of Ordinance held on May 7, 2024.

Owner/Applicant: The property owners are Glen Rodgers and Connie Rodgers, and the applicant is Jaime Douglas.

Site Location: The property is located in Commission District 3 and is on the east side of Ocoee Apopka Road, approximately 3,284 feet south of Fullers Cross Road at its intersection with Ocoee Apopka Road.

Property Size & Parcel Identification Number: The property consists of one (1) parcel containing approximately 5.01 acres and assigned parcel ID numbers 07-22-28-0000-043.

Existing Site Conditions: The table below summarizes the existing site conditions of the property.

Current Future Land Use Map (FLUM) Designation	Current Zoning District	Existing Land Use	Unique Features/Overlay Districts
Low Density Residential (per JPA)	County A-1 (Citrus Rural District)	Agriculture operations	None

The table below lists the jurisdictions, future land use designations, zoning districts, and existing uses of the surrounding properties.

Direction	Jurisdiction	Future Land Use Designation	Zoning	Existing Land Uses
North	City of Ocoee	Low Density Residential	R-1AA	Vacant wooded land

South	City of Ocoee	Low Density Residential	R-1AA	Vacant wooded land
East	City of Ocoee	Low Density Residential	R-1AA	Vacant land
West	City of Ocoee	Light Industrial	PUD-IND	Light industrial/flex warehouse development

Proposed Development: The applicant is requesting an annexation. The initial rezoning to a City zoning classification is not being processed at this time, and as of the date of this staff report, the applicant has not submitted a proposed plan for development.

Consistency with Florida Statutes: With respect to the proposed annexation, Section 171.044, Florida Statutes (F.S.), grants municipalities the authority to annex contiguous, compact, non-circuitous territory so long as it does not create an enclave. The subject property is bordered on all sides by the City's jurisdictional limits and, as such, is contiguous to the City, and the annexation does not create an enclave. Instead, the annexation furthers the City's efforts to reduce existing enclaves within the city limits.

Consistency with JPA Agreement: The property is located within the Ocoee-Orange County Joint Planning Area (JPA), and the proposed annexation is consistent with the terms of the JPA Agreement.

Consistency with Adopted Comprehensive Plan: The annexation is consistent with Future Land Use Element (FLUE) Policy 2.5, which requires the City to consider requests for voluntary annexation when those lands are logical extensions of the existing City limits, when services can be adequately provided and when proposed uses are compatible with the City's Comprehensive Plan, the JPA Agreement, and the City's Annexation Policy.

Transportation and Access: The site is currently accessed by and will continue to be accessed by Ocoee Apopka Road. Because there is no corresponding rezoning or proposed increase in entitlements, a traffic impact analysis is not required at this time.

Utilities: The Utilities Department has no issues with this annexation.

Stormwater: Not applicable.

Schools: Not applicable.

Public Safety: Fire emergency service is available in under five (5) minutes with a flow rate of 1,000 gallons per minute. The property is located within Police Grid 1, with a four (4) minute response time. The nearest police station is 4 miles away, and the average non-emergency travel time is 11 minutes.

Recreation and Open Space: Not applicable.

For more details, please see the attached Annexation and Feasibility Analysis document.

Issue:

Should the Honorable Mayor and City Commissioners approve the proposed ordinance for the Annexation of the 1059 Ocoee Apopka Road - Rodgers Property, assigned parcel ID number 07-22-28-0000-00-043?

Recommendations:

Development Review Committee (DRC) Recommendation

The DRC met on Tuesday, April 2, 2024, to consider this annexation, and identifying no issues, made a

recommendation of approval.

Planning and Zoning Commission (PZC) Recommendation

The PZC met on Tuesday, April 9, 2024, to consider this annexation, and identifying no issues, made a recommendation of approval.

Staff Recommendation

Staff recommends the Honorable Mayor and City Commissioners approve the proposed ordinance for the proposed Annexation of the 1059 Ocoee Apopka Road - Rodgers Property, assigned parcel ID number 07-22-28-0000-00-043.

Attachments:

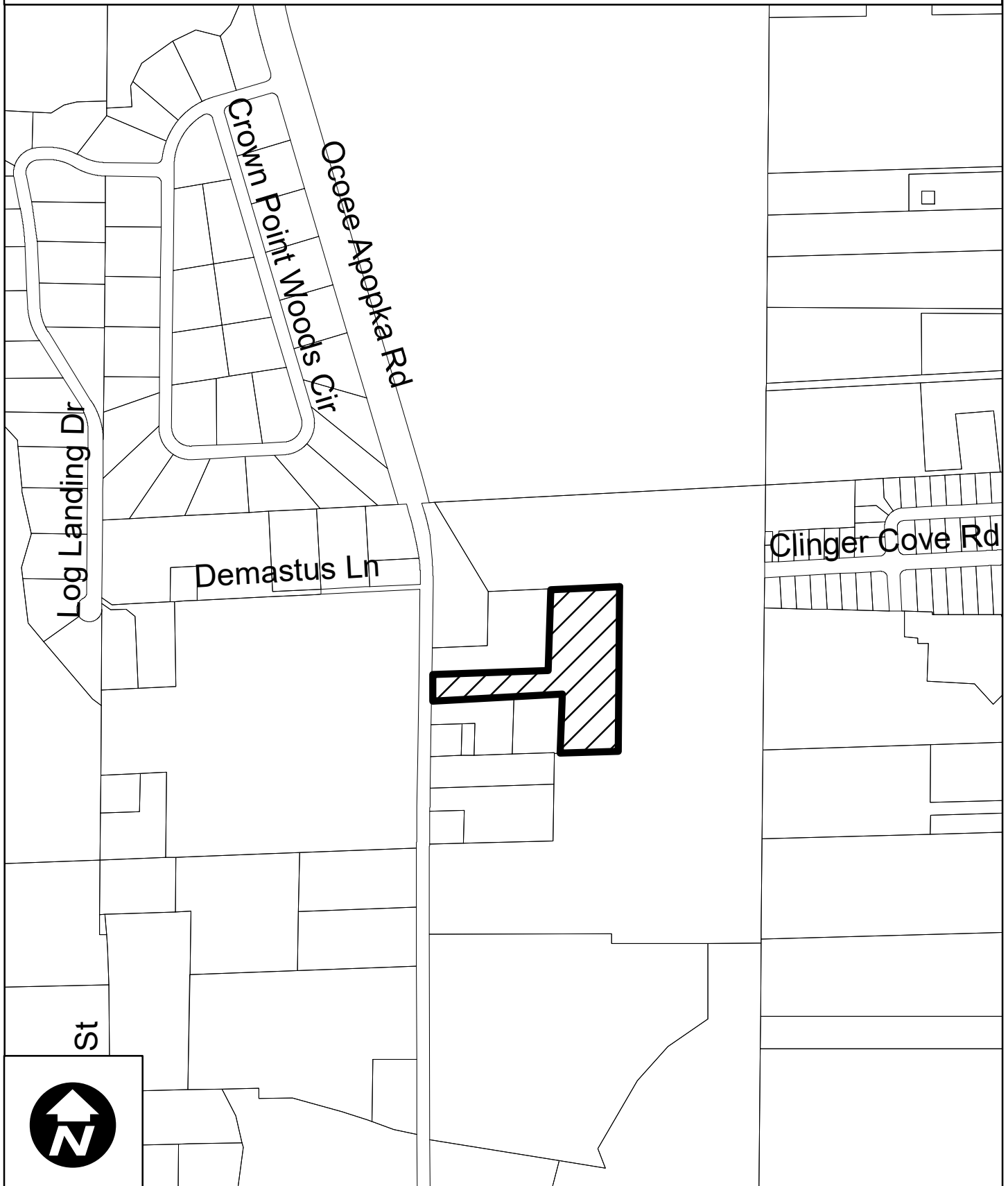
1. Location Map
2. Aerial Map
3. FLU Map
4. Surrounding Zoning Map
5. Survey - Parcel 43
6. Annexation and Rezoning Feasibility Report
7. Annexation Ordinance - 1059 Ocoee Apopka Rd - Rodgers Property
8. Advertisement

Financial Impacts:

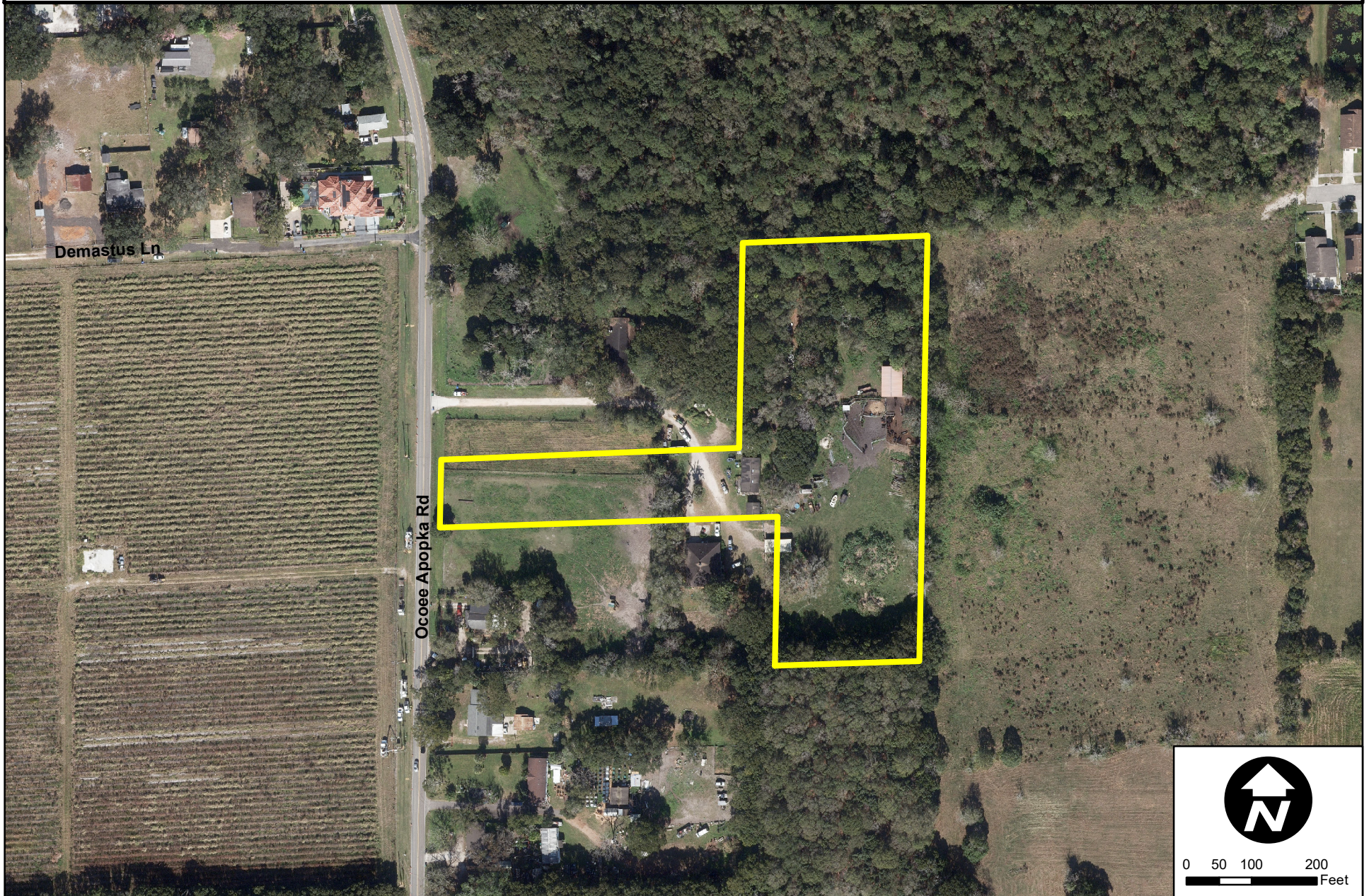
N/A

Type of Item: Second Reading Public Hearing

1059 Ocoee Apopka Road Annexation Location Map



1059 Ocoee Apopka Road - Rodgers Property 2022 Aerial Photography



1059 Ocoee Apopka Road - Rodgers Property Surrounding Future Land Use Map



Ocoee
Development Services
Department

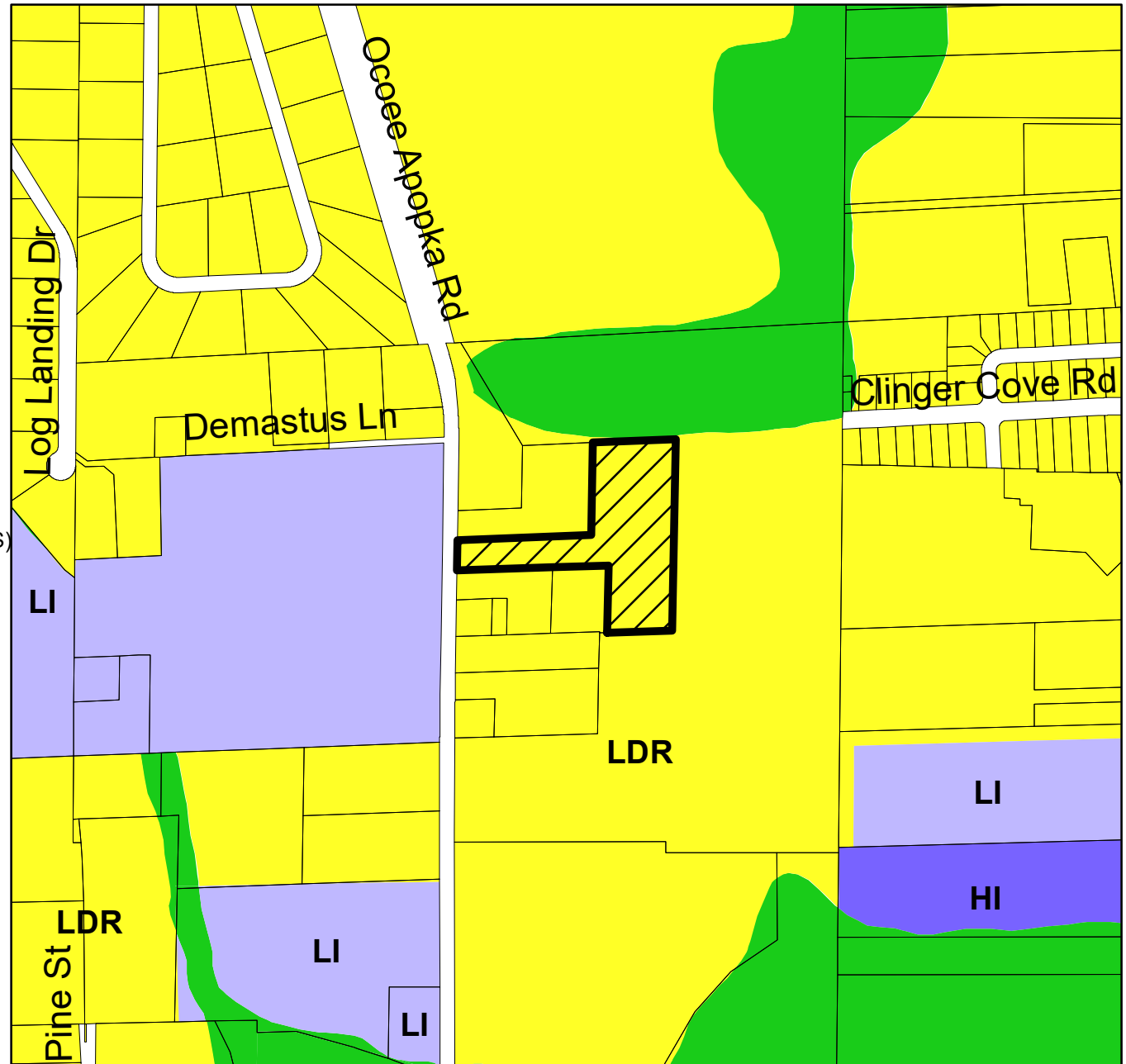
0 130 260 520
Feet

Created: month year

 Subject Property

Future Land Use Classification:

-  Low Density Residential (LDR)
-  Medium Density Residential (MDR)
-  High Density Residential (HDR)
-  Professional Offices and Services (PS)
-  Commercial (COMM)
-  Light Industrial (LI)
-  Heavy Industrial (HI)
-  Conservation/Floodplains (CONS)
-  Recreation and Open Space (REC)
-  Public Facilities/Institutional (INST)



1059 Ocoee Apopka Road - Rodgers Property Surrounding Zoning Map



Development Services
Department

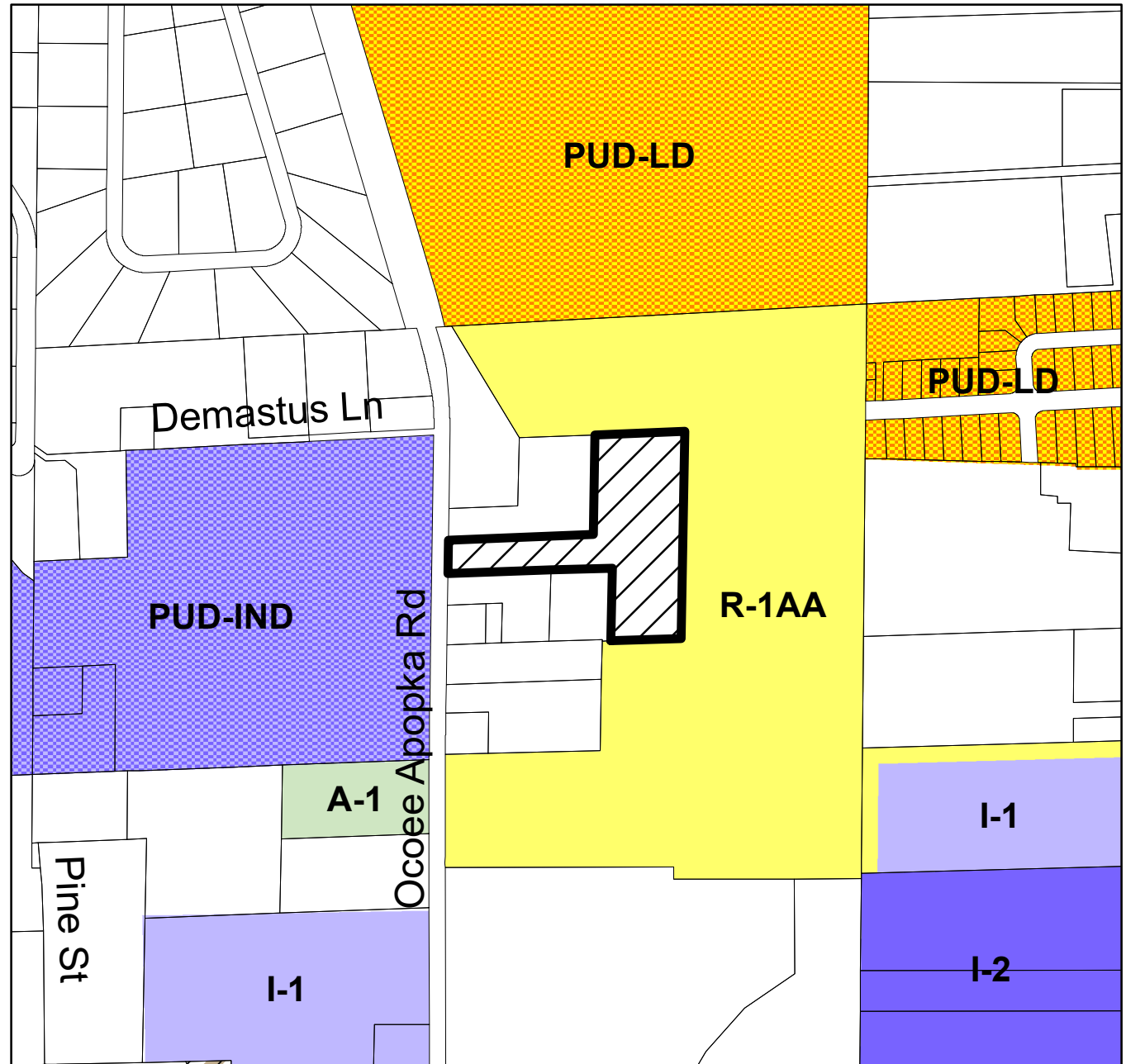
0 120 240 480
Feet

Created: month year

 Subject Property

Zoning Classification:

-  General Agricultural (A-1)
-  Suburban (A-2)
-  Single-Family Dwelling (R-1AAA)
-  Single-Family Dwelling (R-1AA)
-  Single-Family Dwelling (R-1A)
-  Single-Family Dwelling (R-1)
-  One- & Two-Family Dwelling (R-2)
-  Multiple-Family Dwelling (R-3)
-  Mobile Home Subdivision (RT-1)
-  Professional Offices & Services (P-S)
-  Neighborhood Shopping (C-1)
-  Community Commercial (C-2)
-  General Commercial (C-3)
-  Restricted Manufacturing & Warehousing (I-1)
-  General Industrial (I-2)
-  Commercial (PUD)
-  Low Density (PUD)
-  Medium Density (PUD)
-  High Density (PUD)
-  Public Use (PUD)
-  Unclassified



FROM THE CENTER OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, RUN S 01 DEGREE 08 MINUTES 30 SECONDS W ALONG THE NORTH-SOUTH MID SECTION LINE 674.86 FEET, THENCE N 87 DEGREES 47 MINUTES 07 SECONDS E 0.98 FEET FOR A POINT OF BEGINNING; THENCE N 87 DEGREES 47 MINUTES 07 SECONDS E 458.80 FEET, THENCE N 01 DEGREE 08 MINUTES 30 SECONDS E 314.53 FEET, THENCE N 87 DEGREES 47 MINUTES 07 E 283.06 FEET; THENCE S 01 DEGREE 08 MINUTES 30 SECONDS W 651.27 FEET, THENCE S 88 DEGREES 09 MINUTES 30 SECONDS W 221.90 FEET, THENCE S 01 DEGREE 08 MINUTES 30 SECONDS E 228.76 FEET; THENCE S 88 DEGREES 09 MINUTES 30 SECONDS W 519.27 FEET, THENCE N 01 DEGREE 08 MINUTES 30 SECONDS E 104.17 FEET TO THE POINT OF BEGINNING, CONTAINING 5.01 ACRES MORE OR LESS.

BEARINGS SHOWN HEREON ARE BASED ON THE WEST LINE OF THE SOUTHEAST 1/4 OF SECTION 07-22 SOUTH, RANGE 28 EAST AS BEING SOUTH 01°04'14" WEST (AN ASSUMED BEARING FOR ANGULAR DESIGNATION ONLY)

THERE MAY BE EASEMENTS AND RESTRICTIONS OF RECORD AND/OR PRIVATE AGREEMENTS NOT FURNISHED TO THIS SURVEYOR OR SHOWN ON THIS BOUNDARY SURVEY THAT MAY AFFECT PROPERTY RIGHTS AND/OR LAND USE RIGHTS OF THE SUBJECT PROPERTY.

SYMBOLS SHOWN HEREON ARE NOT TO SCALE, AND MAY BE ALTERED FROM THEIR ORIGINAL POSITION FOR VISUAL PURPOSES ONLY.

THERE MAY BE ENVIRONMENTAL ISSUES AND/OR OTHER MATTERS REGULATED BY VARIOUS DEPARTMENTS OF FEDERAL, STATE OR LOCAL GOVERNMENTS AFFECTING THE SUBJECT PROPERTY NOT SHOWN ON THIS SURVEY.

THIS SURVEY WAS PERFORMED FOR THE SOLE AND EXCLUSIVE BENEFIT OF THE ENTITIES LISTED HEREON AND SHALL NOT BE RELIED UPON BY ANY OTHER ENTITY OR INDIVIDUAL WHOMSOEVER.

ADJOINING PARCEL OWNER AND RECORDING INFORMATION DELINEATED HEREON WAS OBTAINED FROM THE ORANGE COUNTY PROPERTY APPRAISER'S PUBLIC WEBSITE.

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER OR AN ELECTRONIC SIGNATURE THAT IS IN COMPLIANCE WITH FLORIDA ADMINISTRATIVE CODE 5J-17.062.

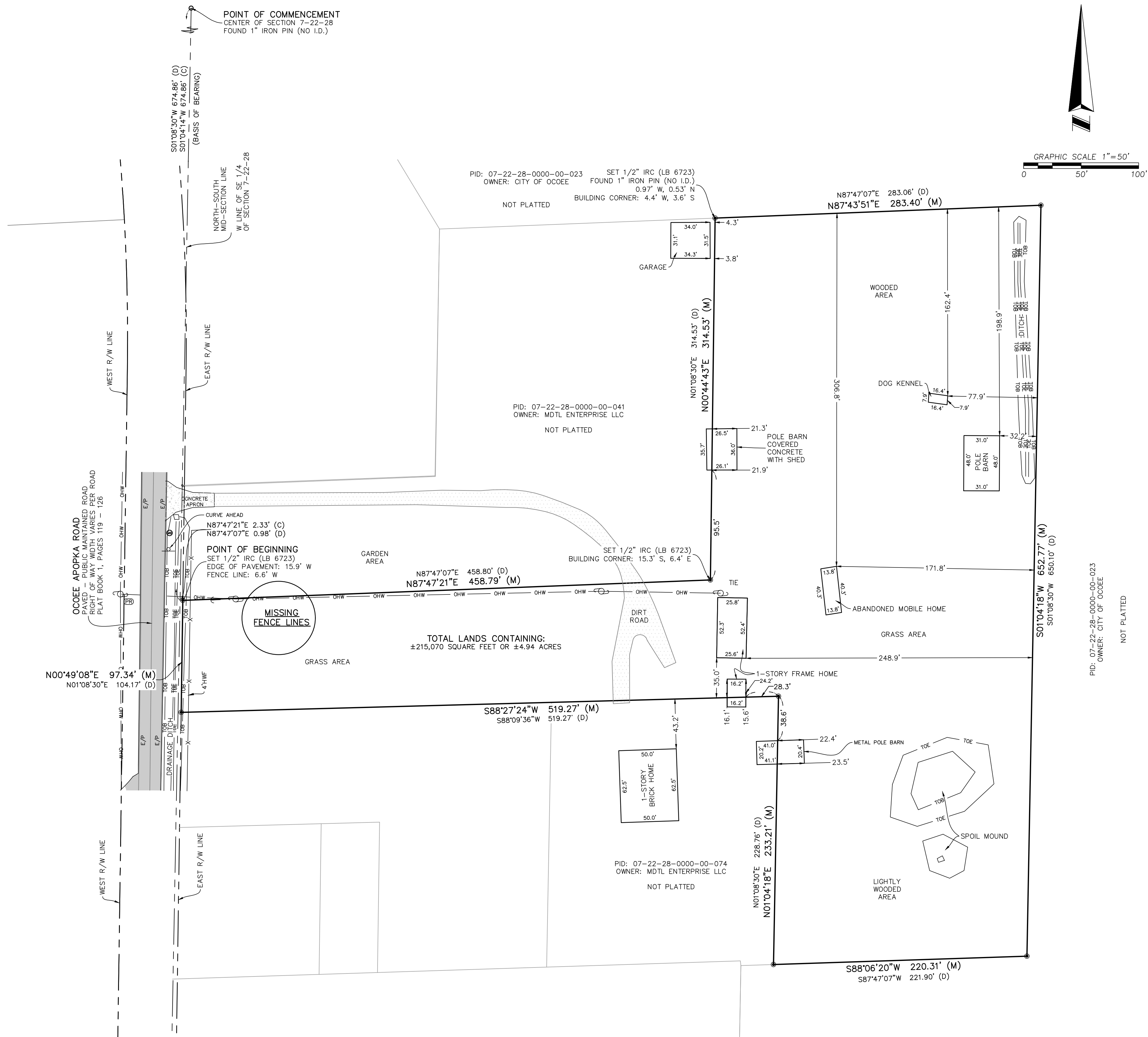
UNLESS OTHERWISE NOTED OR SHOWN HEREON, APPARENT AND/OR VISIBLE, UNOBSTRUCTED, ABOVE GROUND IMPROVEMENTS WERE LOCATED. UNDERGROUND IMPROVEMENTS, SUCH AS FOUNDATIONS AND UTILITIES, WERE NOT LOCATED, UNLESS NOTED OTHERWISE.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, THERE ARE NO APPARENT AND/OR UNOBSTRUCTED, ABOVE GROUND ENCROACHMENTS. THE DISPOSITION OF ANY POTENTIAL ENCROACHING IMPROVEMENTS SHOWN IS BEYOND THE PROFESSIONAL PURVIEW OF THE SURVEYOR AND SUBJECT TO LEGAL INTERPRETATION.

THE ACCURACY OF THE SURVEY MEASUREMENTS USED FOR THIS SURVEY MEETS OR EXCEEDS THE EXPECTED USE OF THE PROPERTY DESCRIBED HEREON. (SUBURBAN) 1 FOOT IN 7,500 FEET.

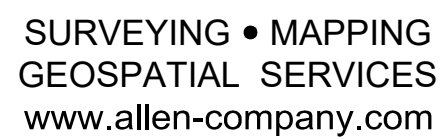
VICINITY MAP:
NOT TO SCALE

CONC	CONCRETE		OVERHEAD ELECTRIC
E/P	EDGE OF PAVEMENT		FENCE LINE AS NOTED
PB	PLAT BOOK		TOP OF BANK
PG(S)	PAGE(S)		TOE OF SLOPE
LB	LICENSED BUSINESS		PHONE RISER
R/W	RIGHT OF WAY		SINGLE STAND SIGN
PID	PARCEL IDENTIFICATION NUMBER		WOODEN POWER POLE
RCP	REINFORCED CONCRETE PIPE		GUY WIRE
C&G	CURB AND GUTTER		FOUND IRON ROD OR PIPE AS NOTED
CLF	CHAIN LINK FENCE		SET 1/2" IRON ROD OR NAIL & DISK LB#6723
IRC	IRON ROD & CAP		MAILBOX
I.D.	IDENTIFICATION		
(D)	DEED		ASPHALT
(M)	MEASURED		
(C)	CALCULATED		DIRT/GRAVEL



PID: 07-22-28-0000-00-023
OWNER: CITY OF OCOEE

NOT PLATTED



16 EAST PLANT STREET
WINTER GARDEN, FLORIDA 34787
(407) 654-5355 LB#6723

BOUNDARY SURVEY
OF
PARCEL ID: 07-22-28-0000-00-043
SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST
ORANGE COUNTY, FLORIDA

FOR:

FOR THE LICENSED BUSINESS #6723 BY:

JAMES L. RICKMAN, P.S.M. #5633

[illegible]

JOB #: 20230899
DATE: 03/08/2024
SCALE: 1" = 50'
CALC BY: DY
FIELD BY: TS
DRAWN BY: MCD
CHECKED BY: DY

SHEET 1 OF 1

CITY OF OCOEE

ANNEXATION FEASIBILITY ANALYSIS

CASE NUMBER: AX-03-24-03 (SAGE # 2024-0015)

APPLICANT NAME: Jaime Douglas

PROJECT NAME: 1059 OCOEE APOPKA RD – RODGERS PROPERTY ANNEXATION

This form is used to evaluate annexation requests to determine the feasibility of providing urban services to individual properties. Each department's findings are summarized below.

I. PLANNING DEPARTMENT

Anoch Whitfield, Zoning Manager

A. Applicant/Owner

1. Owner (if different from Applicant):	Glen Rodgers and Connie Rodgers
---	---------------------------------

B. Property Location

1. General Location:	The property is generally located on the east side of Ocoee Apopka Rd., approximately 3,284 feet south of Fullers Cross Rd. at the intersection of Ocoee Apopka Rd.
2. Parcel Identification Number:	07-22-28-0000-00-043
3. Street Addresses:	To be determined
4. Size of Parcels:	5.01

C. Use Characteristics

1. Existing Use:	Generally vacant lot used for agricultural purposes
2. Proposed use:	No proposed use submitted to the City at this time
3. Density / Intensity:	N/A
4. Projected Population:	N/A

D. Zoning and Land Use

1. Orange County Future Land Use:	Low Density Residential per JPA FLUM
2. Orange County Zoning:	A-1
3. Existing Ocoee Future Land Use:	Low Density Residential per JPA FLUM
4. Proposed Ocoee Zoning:	None at this time. Site will retain County A-1 until rezoning occurs

E. Consistency

1. Joint Planning Area:	Yes
2. Comprehensive Plan:	Yes

II. FIRE DEPARTMENT

1. Estimated Response Time:	Average 5 minutes
2. Distance to Property:	
3. Fire Flow Requirements:	1,000 gallons per minute

III. POLICE DEPARTMENT

1. Police Patrol Zone / Grid / Area:	1
2. Estimated Response Time:	4
3. Distance to Property:	3.2 miles
3. Average Travel Time	11 minutes

IV. ECONOMIC VALUE		Anoch Whitfield, Zoning Manager
1. Property Appraiser Market Value:	\$254,757 (as agriculture operations use in County)	
2. Property Appraiser Taxable Value	\$76,418 (as agriculture operations use in County)	
3. Estimated City Ad Valorem Taxes:	TBD	
4. Anticipated Licenses & Permits:	TBD	
5. Potential Impact Fees:	TBD	
6. Total Project Revenues:	TBD	

V. BUILDING DEPARTMENT	
1. Within the 100-year Flood Plain:	No

VI. UTILITIES		Jennifer Bolling, Engineering Manager
A. Potable Water		
1. In Ocoee Service Area:	Yes	
2. City Capable of Serving Area:	Yes	
3. Extension Needed:	No	
4. Location and Size of Nearest Water Main:	To Be Determined	
B. Sanitary Sewer		
1. In Ocoee Service Area:	Yes	
2. City Capable of Serving Area:	Yes	
3. Extension Needed:	Yes	
4. Location and Size of Nearest Force Main:	To BE Determined	
5. Annexation Agreement Needed:		
C. Other		
1. Utility Easement Needed:	Yes	
2. Private Lift Station Needed:	Yes or as determined by Utilities Department	
3. Well Protection Area Needed:	No	

VII. TRANSPORTATION		Anoch Whitfield, Zoning Manager
1. Paved Access:	Yes	
2. ROW Dedication:	To be determined	
3. Traffic Study:	Not required at this time for annexation	
4. Traffic Analysis Zone:		

VIII. PRELIMINARY CONCURRENCY EVALUATION	
---	--

A. Transportation:	Full traffic impact analysis will be required prior to any non-residential development
B. Parks / Recreation:	Not applicable at this time
C. Water / Sewer:	Water is available; however, sewer is not available currently.
D. Stormwater:	To be provided on site at time of development
E. Solid Waste:	At this time, adequate solid waste capacity exists.
F. Impact Fees:	TBD at time of building permit

IX. SITE SPECIFIC ISSUES	All Departments
---------------------------------	-----------------

X. CONSISTENCY WITH STATE ANNEXATION REGULATIONS	Anoch Whitfield, Zoning Manager
---	---------------------------------

The property to be annexed borders the City Limits on its north, east and south sides; therefore, the annexation of this property will further reduce the existing enclaves within the City limits. No part of the area to be annexed is included within the boundary of another municipality, and the property being annexed will be developed for urban purposes. Therefore, this annexation is consistent with Section 171.043(1) & (2), Florida Statutes.

**ORDINANCE NO. 2024-
(Annexation Ordinance for 1059 Ocoee Apopka Rd –
Rodgers Property)**

TAX PARCEL ID: 07-22-28-0000-00-043

CASE NO. AX-03-24-03: 1059 Ocoee Apopka Road - Rodgers Property Annexation

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 5.01 ACRES LOCATED AT 1059 OCOEE APOPKA ROAD ON THE EAST SIDE OF OCOEE APOPKA ROAD, APPROXIMATELY 3,284 FEET SOUTH OF FULLERS CROSS ROAD AT ITS INTERSECTION WITH OCOEE APOPKA ROAD AND ASSIGNED PARCEL ID NUMBER 07-22-28-0000-00-043, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, pursuant to Section 171.044, Florida Statutes, the owner of certain real properties located in unincorporated Orange County, Florida, as hereinafter described, has petitioned the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to annex approximately 5.01 acres of property, as more particularly described in **Exhibit “A”** attached hereto, into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, the Ocoee City Commission has determined that said petition bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, notice of the proposed annexation has been published pursuant to the requirements of Section 171.044(2), Florida Statutes, and Section 5-9(E), Article V, Land Development Code of the City of Ocoee (the “Code”); and

WHEREAS, on April 9, 2024, the Planning and Zoning Commission of the City of Ocoee, Florida, reviewed the proposed annexation and found it to be consistent with the Ocoee Comprehensive Plan, to comply with all applicable requirements of the Ocoee City Code, and to be in the best interest of the City of Ocoee and has recommended to the Ocoee City Commission that it approve said annexation petition; and

WHEREAS, the Ocoee City Commission has the authority, pursuant to Section 171.044, Florida Statutes, to annex said real property into its corporate limits upon petition of the owners of said real property; and

WHEREAS, the Ocoee City Commission is desirous of annexing and redefining the boundary lines of the City of Ocoee, Florida, to include said real property.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

Section 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida, Chapters 166 and 171, Florida Statutes, and Section C-7 of Article 1 of the Charter of the City of Ocoee, Florida.

Section 2. PETITION. The Ocoee City Commission hereby finds that the petition to annex certain lands, as hereinafter described, into the corporate limits of the City of Ocoee, Florida, bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida.

Section 3. ANNEXATION. The following described real property located in unincorporated Orange County, Florida, is hereby annexed into the corporate limits of the City of Ocoee, Florida:

**SEE EXHIBIT “A” ATTACHED HERETO AND BY THIS
REFERENCE MADE A PART HEREOF**

Section 4. MAP. A map of said land herein described, which clearly shows the annexed area, is attached hereto as **EXHIBIT “B”** and by this reference is made a part hereof.

Section 5. CONSISTENCY FINDING. The Ocoee City Commission hereby finds that the annexation of said land herein described is consistent with the Ocoee Comprehensive Plan, as amended, and meets all of the requirements for annexation set forth in Florida Statutes § 171.044, the Ocoee Comprehensive Plan and the Ocoee City Code.

Section 6. CORPORATE LIMITS. The corporate territorial limits of the City of Ocoee, Florida, are hereby redefined to include said land herein described and annexed.

Section 7. OFFICIAL MAPS. The City Clerk is hereby authorized to update and supplement official City maps of the City of Ocoee, Florida, to include said land herein described and annexed.

Section 8. LIABILITY. The land herein described and future inhabitants of said land herein described shall be liable for all debts and obligations and be subject to all species of taxation, laws, ordinances, and regulations of the City of Ocoee, Florida, and be entitled to the same privileges and benefits as other areas of the City of Ocoee, Florida.

Section 9. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of

competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

Section 10. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

Section 11. EFFECTIVE DATE. This Ordinance shall become effective upon passage and adoption. Thereafter, the City Clerk is hereby directed to file a certified copy of this Ordinance with the Clerk of the Circuit Court for Orange County, Florida, the Chief Administrative Officer of Orange County, Florida, and with the Florida Department of State within seven (7) days from the effective date.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

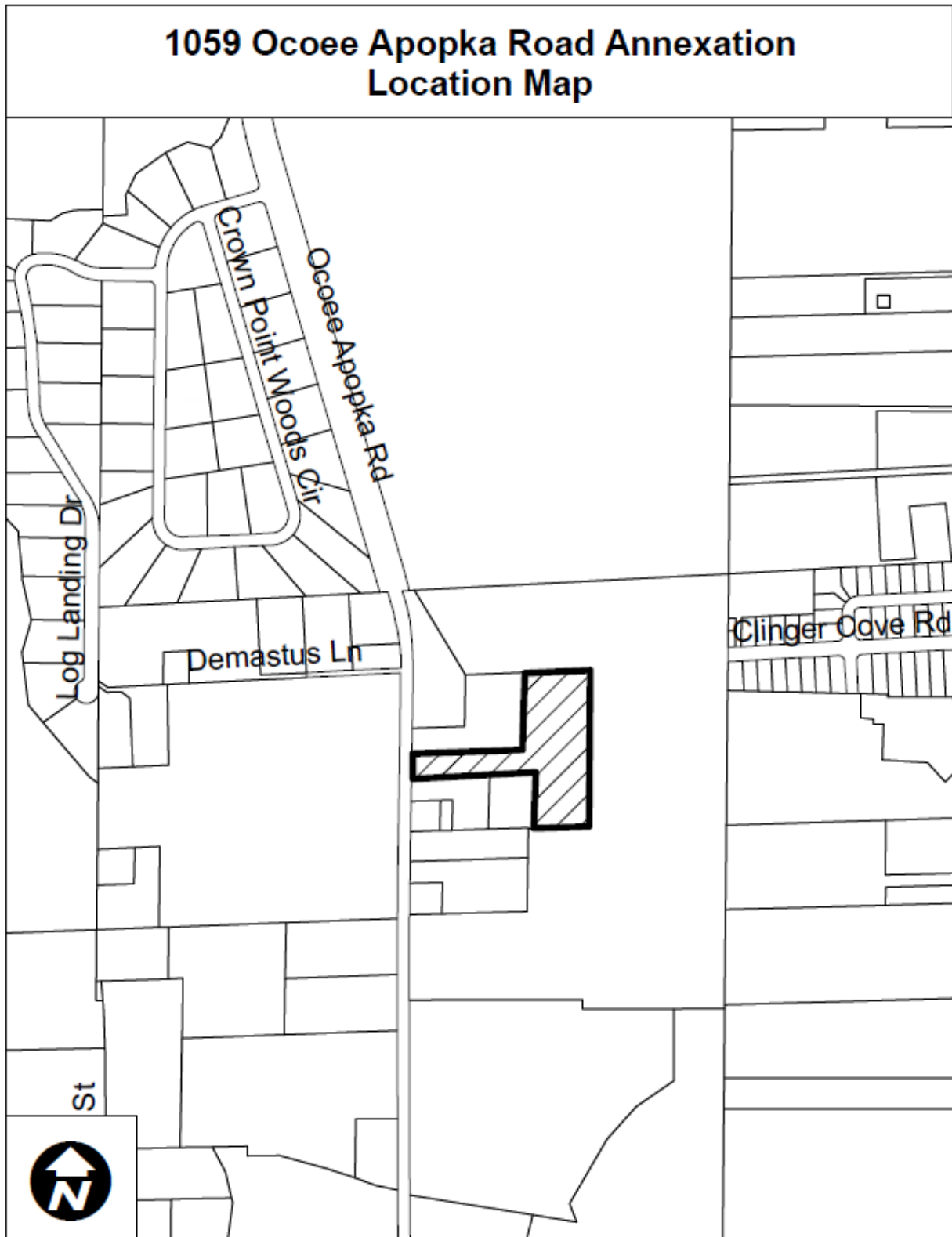
LEGAL DESCRIPTION

PARCEL ID NO.: 07-22-28-0000-00-043

FROM THE NW COR OF NW1/4 OF SE1/4 RUN S 1 DEG W 674.86 FT N 87 DEG E 0.98 FT FOR POB
THN N 87 DEG E 458.80 FT N 1 DEG E 314.53 FT N 87 DEG E 283.06 FT S 1 DEG W 650.10 FT S 87
DEG W 221.90 FT N 1 DEG E 228.76 FT W 519.27 FT N 1 DEG E 104.17 FT TO POB (LESS W 30 FT RD
R/W) IN SEC 07-22-28

EXHIBIT "B"

LOCATION MAP



West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
1059 OCOEE APOPKA ROAD - RODGERS PROPERTY
ANNEXATION
CASE NUMBER: AX-03-24-03

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-10, of the City of Ocoee Land Development Code that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider the Annexation for 1059 Ocoee Apopka Road – Rodgers Property Annexation. The property is assigned Parcel ID #07-22-28-0000-00-043, comprising approximately 5.01 acres. The property is located on the east side of Ocoee Apopka Rd., approximately 3,284 feet south of Fullers Cross Rd. at its intersection with Ocoee Apopka Rd.

ORDINANCE NO. 2024-14

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 5.01 ACRES LOCATED AT 1059 OCOEE APOPKA ROAD ON THE EAST SIDE OF OCOEE APOPKA ROAD, APPROXIMATELY 3,284 FEET SOUTH OF FULLERS CROSS ROAD AT ITS INTERSECTION WITH OCOEE APOPKA ROAD AND ASSIGNED PARCEL ID NUMBER 07-22-28-0000-00-043, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

If the applicant's request for annexation is approved, the annexation will incorporate the property into the City of Ocoee. Pursuant to Subsection 5-9 B. of the Land Development Code, the Planning Director has determined that the requested annexation is within the Ocoee-Orange County Joint Planning Area (JPA) and is consistent with the Ocoee-Orange County JPA Land Use Map and the Ocoee Comprehensive Plan.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 16, 2024

24-01546W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.



STAFF REPORT

Meeting Date: May 21, 2024
Item #: 13

Contact Name: Anoch Whitfield
Contact Number: Ext. 1016

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Second Reading of Ordinance for 1102 & 1104 N. Lakewood Avenue - Lott Property Annexation; Project No. AX-03-24-01. (Zoning Manager Whitfield)

Background Summary: First Reading of Ordinance held on May 7, 2024.

Owner/Applicant: The property owner is Johnnie Paul Lott, Jr., and the applicant is Jaime Douglas.

Site Location: The property is located in Commission District 3 and is on the west side of North Lakewood Avenue, approximately 946 feet south of Wurst Road at its intersection with North Lakewood Avenue.

Property Size & Parcel Identification Number: The property consists of two (2) parcels totaling approximately 7.17 acres and assigned parcel ID numbers 07-22-28-0000-00-060 & 07-22-28-0000-00-057.

Existing Site Conditions: The table below summarizes the existing site conditions of the property.

Current Future Land Use Map (FLUM) Designation	Current Zoning District	Existing Land Use	Unique Features/Overlay Districts
Low Density Residential (per JPA)	County A-1 (Citrus Rural District)	Small industrial warehouse building on parcel 07-22-28-0000-00-057 Parcel 07-22-28-0000-00-060 is vacant with scattered trees	None

The table below lists the jurisdictions, future land use designations, zoning districts, and existing uses of the surrounding properties.

Direction	Jurisdiction	Future Land Use Designation	Zoning	Existing Land Uses
North	Orange County	Low Density Residential	County A-1	Agriculture horse farm along western side of north

				boundary & single family residential home on eastern side of north boundary
South	City of Ocoee	Light Industrial	I-1	Wooded undeveloped parcel
East	Orange County	Low Density Residential	County R-2 (Residential District)	Single residential homes
West	City of Ocoee	Low Density Residential	City R-1AA	Undeveloped parcel with scattered trees

Proposed Development: The applicant is requesting an annexation. The initial rezoning to a City zoning classification is not being processed at this time, and as of the date of this staff report, the applicant has not submitted a proposed plan for development.

Consistency with Florida Statutes: With respect to the proposed annexation, Section 171.044, Florida Statutes (F.S.), grants municipalities the authority to annex contiguous, compact, non-circuitous territory so long as it does not create an enclave. The subject property is bordered on its south and west sides by the City's jurisdictional limits and, as such, is contiguous to the City, and the annexation does not create an enclave. Instead, the annexation furthers the City's efforts to reduce existing enclaves within the city limits.

Consistency with JPA Agreement: The property is located within the Ocoee-Orange County Joint Planning Area (JPA), and the proposed annexation is consistent with the terms of the JPA Agreement.

Consistency with Adopted Comprehensive Plan: The annexation is consistent with Future Land Use Element (FLUE) Policy 2.5, which requires the City to consider requests for voluntary annexation when those lands are logical extensions of the existing City limits, when services can be adequately provided and when proposed uses are compatible with the City's Comprehensive Plan, the JPA Agreement, and the City's Annexation Policy.

Transportation and Access: The site is currently accessed by and will continue to be accessed by North Lakewood Avenue. Because there is no corresponding rezoning or proposed increase in entitlements, a traffic impact analysis is not required at this time.

Utilities: The Utilities Department has no issues with this annexation.

Stormwater: Not applicable.

Schools: Not applicable.

Public Safety: The nearest fire station is located within 1.8 miles, and fire emergency service is available in under five (5) minutes with a flow rate of 1,000 gallons per minute. The property is located within Police Grid 1, with a four (4) minute response time. The nearest police station is 2.9 miles away, and the average non-emergency travel time is 11 minutes.

Recreation and Open Space: Not applicable.

For more details, please see the attached Annexation and Feasibility Analysis document.

Issue:

Should the Honorable Mayor and City Commissioners approve the proposed Annexation of the 1102 and 1104

North Lakewood Avenue - Lott Property, assigned parcel ID numbers 07-22-28-0000-00-057 and 07-22-28-0000-00-060?

Recommendations:

Development Review Committee (DRC) Recommendation

The DRC met on Tuesday, April 2, 2024, to consider this annexation, and identifying no issues, made a recommendation of approval.

Planning and Zoning Commission (PZC) Recommendation

The PZC met on Tuesday, April 9, 2024, to consider this annexation, and identifying no issues, made a unanimous recommendation of approval.

Staff Recommendation

Staff recommends the Honorable Mayor and City Commissioners approve the proposed ordinance for the Annexation of the 1102 and 1104 North Lakewood Avenue - Lott Property, assigned parcel ID numbers 07-22-28-0000-00-057 and 07-22-28-0000-00-060.

Attachments:

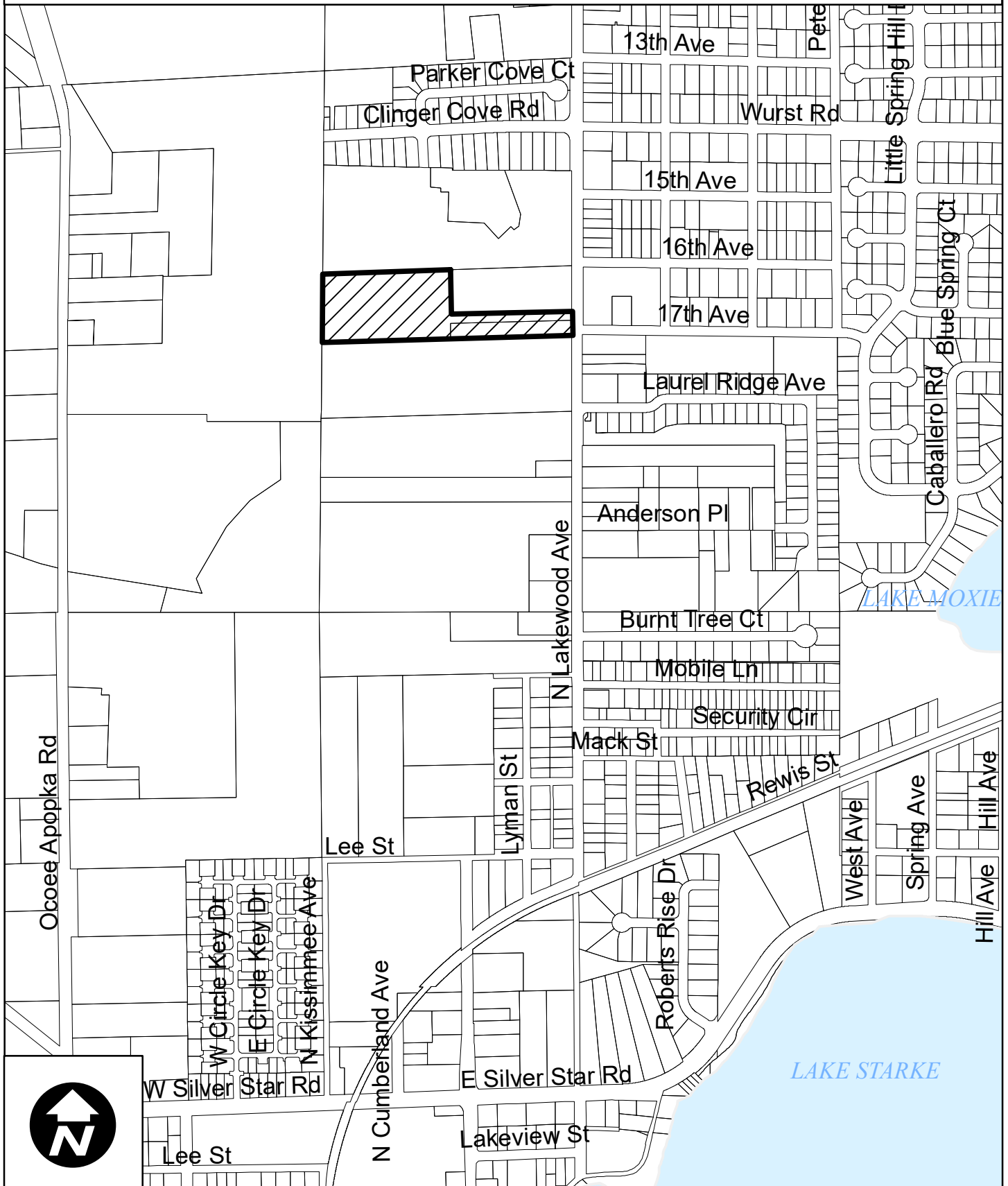
1. Location Map
2. Aerial Map
3. FLUM
4. Zoning Map
5. Annexation and Rezoning Feasibility Report
6. Survey - Parcel 57
7. Survey - Parcel 60
8. Annexation Ordinance - 1102 & 1104 N Lakewood Ave - Lott Property
9. Advertisement

Financial Impacts:

N/A

Type of Item: Second Reading Public Hearing

1102 & 1104 N Lakewood Ave Annexation Location Map



1102 & 1104 N Lakewood Ave - Lott Property 2022 Aerial Photography



1102 & 1104 N Lakewood Ave - Lott Property Surrounding Future Land Use Map



Development Services
Department

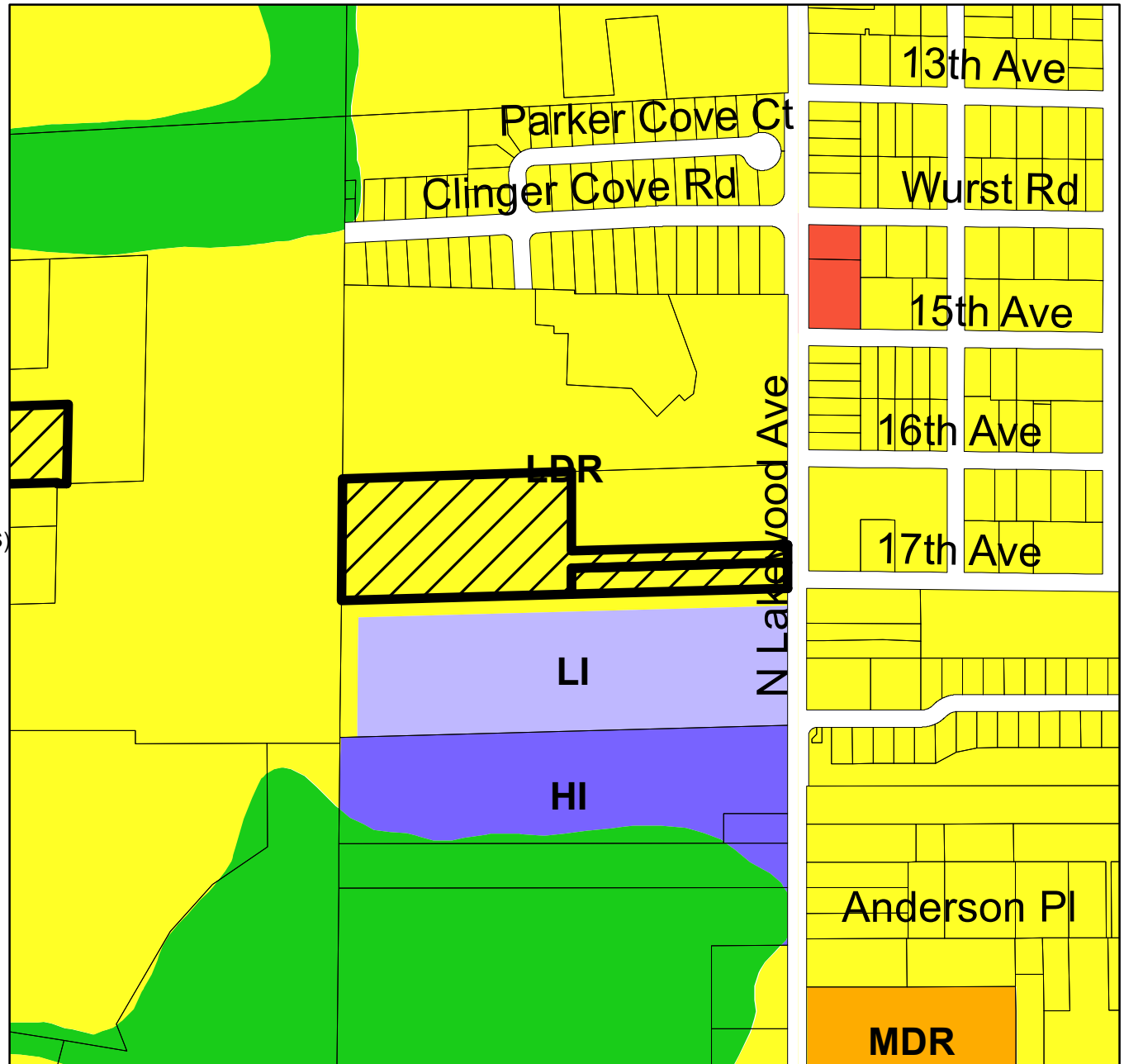
0 112.5 225 450
Feet

Created: month year

 Subject Property

Future Land Use Classification:

-  Low Density Residential (LDR)
-  Medium Density Residential (MDR)
-  High Density Residential (HDR)
-  Professional Offices and Services (PS)
-  Commercial (COMM)
-  Light Industrial (LI)
-  Heavy Industrial (HI)
-  Conservation/Floodplains (CONS)
-  Recreation and Open Space (REC)
-  Public Facilities/Institutional (INST)



1102 & 1104 N Lakewood Avenue - Lott Property Surrounding Zoning Map



Development Services
Department

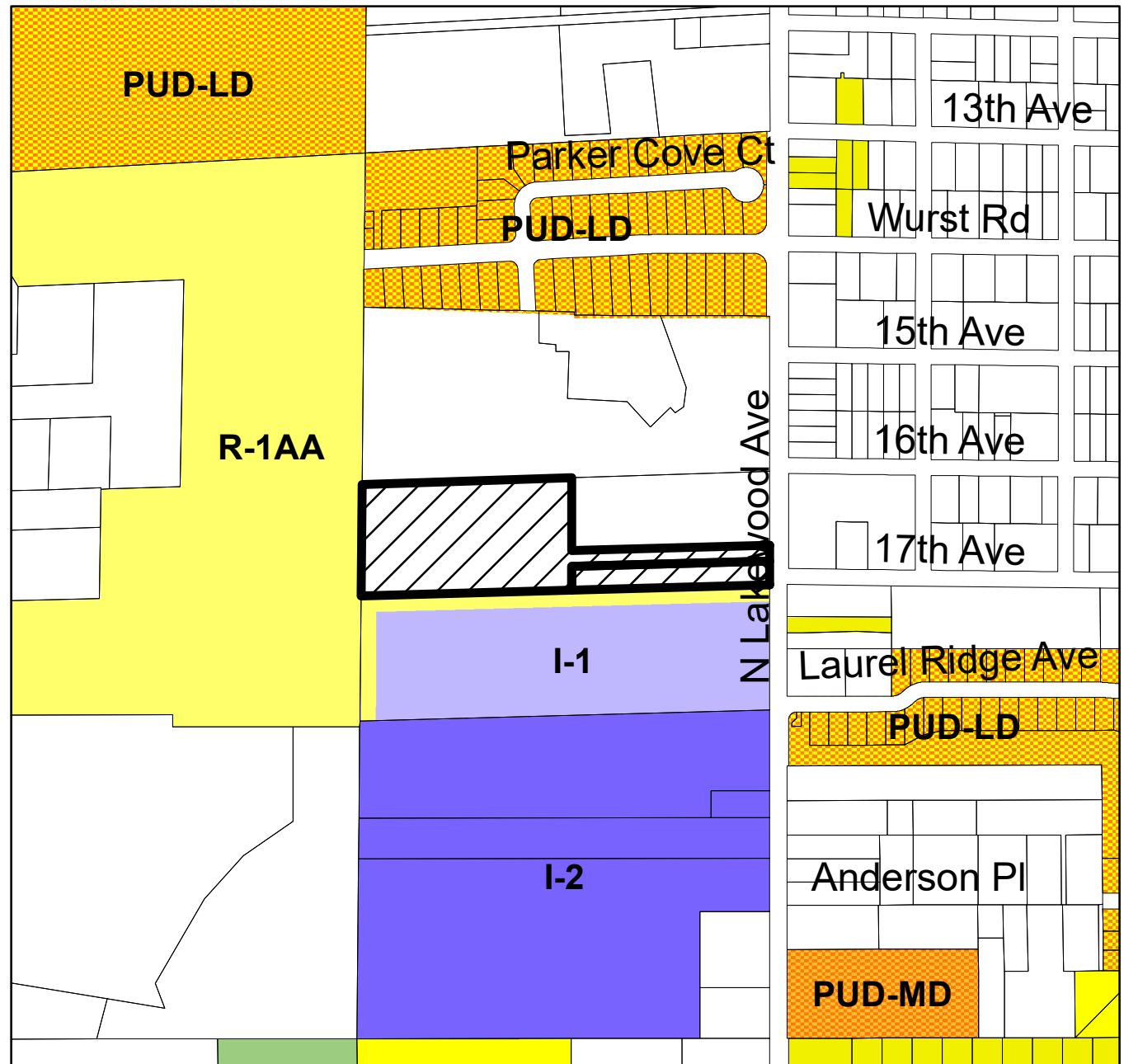
0 120 240 480
Feet

Created: month year

 Subject Property

Zoning Classification:

-  General Agricultural (A-1)
-  Suburban (A-2)
-  Single-Family Dwelling (R-1AAA)
-  Single-Family Dwelling (R-1AA)
-  Single-Family Dwelling (R-1A)
-  Single-Family Dwelling (R-1)
-  One- & Two-Family Dwelling (R-2)
-  Multiple-Family Dwelling (R-3)
-  Mobile Home Subdivision (RT-1)
-  Professional Offices & Services (P-S)
-  Neighborhood Shopping (C-1)
-  Community Commercial (C-2)
-  General Commercial (C-3)
-  Restricted Manufacturing & Warehousing (I-1)
-  General Industrial (I-2)
-  Commercial (PUD)
-  Low Density (PUD)
-  Medium Density (PUD)
-  High Density (PUD)
-  Public Use (PUD)
-  Unclassified



CITY OF OCOEE

ANNEXATION FEASIBILITY ANALYSIS

CASE NUMBER: AX-03-24-01 (SAGE # 2024-0017)

APPLICANT NAME: Jaime Douglas

PROJECT NAME: 1102 & 1104 N LAKEWOOD AVE – LOTT PROPERTY ANNEXATION

This form is used to evaluate annexation requests to determine the feasibility of providing urban services to individual properties. Each department's findings are summarized below.

I. PLANNING DEPARTMENT

Anoch Whitfield, Zoning Manager

A. Applicant/Owner

1. Owner (if different from Applicant):	Johnnie Paul Lott, Jr.
---	------------------------

B. Property Location

1. General Location:	The properties are generally located on the west side of N. Lakewood Ave., approximately 946 feet south of intersection of Wurst Rd. and N. Lakewood Ave.
2. Parcel Identification Number:	07-22-28-0000-00-057 & 07-22-28-0000-00-060
3. Street Addresses:	To be determined
4. Size of Parcels:	7.17 acres (2 parcels)

C. Use Characteristics

1. Existing Use:	The larger parcel has a small industrial warehouse, and the smaller parcel is vacant.
2. Proposed use:	No proposed use submitted to the City at this time
3. Density / Intensity:	N/A
4. Projected Population:	N/A

D. Zoning and Land Use

1. Orange County Future Land Use:	Low Density Residential per JPA FLUM
2. Orange County Zoning:	A-1
3. Existing Ocoee Future Land Use:	Low Density Residential per JPA FLUM
4. Proposed Ocoee Zoning:	None at this time. Site will retain County A-1 until rezoning occurs

E. Consistency

1. Joint Planning Area:	Yes
2. Comprehensive Plan:	Yes

II. FIRE DEPARTMENT

1. Estimated Response Time:	Under 5 minutes
2. Distance to Property:	1.8 miles
3. Fire Flow Requirements:	1,000 gallons per minute

III. POLICE DEPARTMENT

1. Police Patrol Zone / Grid / Area:	1
2. Estimated Response Time:	4 mins
3. Distance to Property:	2.9 miles
3. Average Travel Time	11 mins

IV. ECONOMIC VALUE		Anoch Whitfield, Zoning Manager
1. Property Appraiser Market Value:	\$ 757,715 (combined)	
2. Property Appraiser Taxable Value	\$ 511,225 (combined)	
3. Estimated City Ad Valorem Taxes:	TBD	
4. Anticipated Licenses & Permits:	TBD	
5. Potential Impact Fees:	TBD	
6. Total Project Revenues:	TBD	

V. BUILDING DEPARTMENT	
1. Within the 100-year Flood Plain:	No

VI. UTILITIES		Jennifer Bolling, Engineering Manager
A. Potable Water		
1. In Ocoee Service Area:	Yes	
2. City Capable of Serving Area:	Yes	
3. Extension Needed:	No	
4. Location and Size of Nearest Water Main:	To Be Determined	
B. Sanitary Sewer		
1. In Ocoee Service Area:	Yes	
2. City Capable of Serving Area:	Yes	
3. Extension Needed:	Yes	
4. Location and Size of Nearest Force Main:	To BE Determined	
5. Annexation Agreement Needed:		
C. Other		
1. Utility Easement Needed:	Yes	
2. Private Lift Station Needed:	Yes or as determined by Utilities Department	
3. Well Protection Area Needed:	No	

VII. TRANSPORTATION		Anoch Whitfield, Zoning Manager
1. Paved Access:	Yes	
2. ROW Dedication:	To be determined	
3. Traffic Study:	Not required at this time for annexation	
4. Traffic Analysis Zone:		

VIII. PRELIMINARY CONCURRENCY EVALUATION

A. Transportation:	Full traffic impact analysis will be required prior to any non-residential development
B. Parks / Recreation:	Not applicable at this time
C. Water / Sewer:	Water is available; however, sewer is not available currently.
D. Stormwater:	To be provided on site at time of development
E. Solid Waste:	At this time, adequate solid waste capacity exists.
F. Impact Fees:	TBD at time of building permit

IX. SITE SPECIFIC ISSUES All Departments

X. CONSISTENCY WITH STATE ANNEXATION REGULATIONS Anoch Whitfield, Zoning Manager

The properties to be annexed border the City Limits on their south side, and the larger parcel is also bordered by the City on its west side; therefore, the annexation of these properties will further reduce the existing enclaves within the City limits. No part of the area to be annexed is included within the boundary of another municipality, and the properties being annexed will be developed for urban purposes. Therefore, this annexation is consistent with Section 171.043(1) & (2), Florida Statutes.

BEGIN AT THE SW CORNER OF THE NE 1/4 OF THE SE 1/4 OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, RUN THENCE NORTH 349.5 FEET, THENCE EAST 663 FEET, THENCE SOUTH 353.9 FEET, THENCE WEST 663.8 FEET TO POINT OF BEGINNING. CONTAINING FIVE ACRES MORE OR LESS AND

BEGINNING AT A POINT ON CENTER LINE OF CLARCONA ROAD 75 FEET NORTH OF THE SE CORNER OF THE NE 1/4 OF THE SE 1/4 OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, RUN THENCE WEST 656 FEET; THENCE NORTH 50 FEET; THENCE EAST 656 FEET, MORE OR LESS TO CENTER LINE OF CLARCONA ROAD, THENCE SOUTH TO POINT OF BEGINNING

BEARINGS SHOWN HEREON ARE BASED ON THE EAST LINE OF THE SOUTHEAST 1/4 OF SECTION 07-22 SOUTH, RANGE 28 EAST AS BEING SOUTH 00°01'06" WEST (AN ASSUMED BEARING FOR ANGULAR DESIGNATION ONLY).

THERE MAY BE EASEMENTS AND RESTRICTIONS OF RECORD AND/OR PRIVATE AGREEMENTS NOT FURNISHED TO THIS SURVEYOR OR SHOWN ON THIS BOUNDARY SURVEY THAT MAY AFFECT PROPERTY RIGHTS AND/OR LAND USE RIGHTS OF THE SUBJECT PROPERTY.

THERE MAY BE ENVIRONMENTAL ISSUES AND/OR OTHER MATTERS REGULATED BY VARIOUS DEPARTMENTS OF FEDERAL, STATE OR LOCAL GOVERNMENTS AFFECTING THE SUBJECT PROPERTY NOT SHOWN ON THIS SURVEY.

ADJOINING PARCEL OWNER AND RECORDING INFORMATION DELINEATED HEREON WAS OBTAINED FROM THE ORANGE COUNTY PROPERTY APPRAISER'S PUBLIC WEBSITE.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, APPARENT AND/OR VISIBLE, UNOBSTRUCTED, ABOVE GROUND IMPROVEMENTS WERE LOCATED. UNDERGROUND IMPROVEMENTS, SUCH AS FOUNDATIONS AND UTILITIES, WERE NOT LOCATED, UNLESS NOTED OTHERWISE.

THE ACCURACY OF THE SURVEY MEASUREMENTS USED FOR THIS SURVEY MEETS OR EXCEEDS THE EXPECTED USE OF THE PROPERTY DESCRIBED HEREON. (SUBURBAN) 1 FOOT IN 7,500 FEET.

CONC	CONCRETE
E/P	EDGE OF PAVEMENT
PB	PLAT BOOK
PG(S)	PAGE(S)
LB	LICENSED BUSINESS
R/W	RIGHT OF WAY
PID	PARCEL IDENTIFICATION NUMBER
RCP	REINFORCED CONCRETE PIPE
C&G	CURB AND GUTTER
CLF	CHAIN LINK FENCE
IRC	IRON ROD & CAP
HWF	HOG WIRE FENCE
WRF	WOOD RAIL FENCE
WPP	WOOD POWER POLE
(D)	DEED
(M)	MEASURED
(C)	CALCULATED

-
- A detailed street map of the area around the 'SITE'. The 'SITE' is a rectangular lot located between N Lake Wood Ave and Clinger Cove Rd. To the north of the site are Parker Cove Ct and Clinger Cove Rd. To the east of the site are several streets including 12th Ave, 13th Ave, Wursth Rd, 15th Ave, 16th Ave, 17th Ave, Laurel Ridge Ave, and Basking Ridge Ct. To the south of the site is Burnt Tree Ct. A north arrow is located in the top left corner of the map.

Drawing name: L:\Data\20230899\DWG\20230899 PARCEL 57 24x36-Bndy Sheet-1

BEGIN AT THE SOUTHEAST CORNER OF THE NORTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, RUN WEST 656 FEET, NORTH 75 FEET, EAST 656 FEET, SOUTH 75 FEET TO POINT OF BEGINNING; LESS THE EAST 30 FEET FOR ROAD.

BEARINGS SHOWN HEREON ARE BASED ON THE EAST LINE OF THE SOUTHEAST 1/4 OF SECTION 07-22 SOUTH, RANGE 28 EAST AS BEING SOUTH 00°01'06" WEST (AN ASSUMED BEARING FOR ANGULAR DESIGNATION ONLY)

THERE MAY BE EASEMENTS AND RESTRICTIONS OF RECORD AND/OR PRIVATE AGREEMENTS NOT FURNISHED TO THIS SURVEYOR OR SHOWN ON THIS BOUNDARY SURVEY THAT MAY AFFECT PROPERTY RIGHTS AND/OR LAND USE RIGHTS OF THE SUBJECT PROPERTY.

THERE MAY BE ENVIRONMENTAL ISSUES AND/OR OTHER MATTERS REGULATED BY VARIOUS DEPARTMENTS OF FEDERAL, STATE OR LOCAL GOVERNMENTS AFFECTING THE SUBJECT PROPERTY NOT SHOWN ON THIS SURVEY.

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER OR AN ELECTRONIC SIGNATURE THAT IS IN COMPLIANCE WITH FLORIDA ADMINISTRATIVE CODE 5J-17.062.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, THERE ARE NO APPARENT AND/OR UNOBSTRUCTED, ABOVE GROUND ENCROACHMENTS. THE DISPOSITION OF ANY POTENTIAL ENCROACHING IMPROVEMENTS SHOWN IS BEYOND THE PROFESSIONAL PURVIEW OF THE SURVEYOR AND SUBJECT TO LEGAL INTERPRETATION.

LAST DATE IN FIELD: FEBRUARY 29, 2024



CONC	CONCRETE		OHW	OVERHEAD ELECTRIC
E/P	EDGE OF PAVEMENT		X	FENCE LINE AS NOTED
PB	PLAT BOOK		TOB	TOP OF BANK
PG(S)	PAGE(S)		TOE	TOE OF SLOPE
LB	LICENSED BUSINESS		W	WELL
R/W	RIGHT OF WAY			WOODEN LIGHT POLE
PID	PARCEL IDENTIFICATION NUMBER			WOODEN POWER POLE
RCP	REINFORCED CONCRETE PIPE		→	GUY WIRE
C&G	CURB AND GUTTER		●	FOUND IRON ROD OR PIPE AS NOTED
CLF	CHAIN LINK FENCE		●	SET 1/2" IRON ROD OR NAIL & DISK LB#6723
IRC	IRON ROD & CAP		MB	MAILBOX
(D)	DEED		TR	TELECOMMUNICATION RISER
(M)	MEASURED			ASPHALT
(C)	CALCULATED			



SHEET 1 OF 1

**ORDINANCE NO. 2024-
(Annexation Ordinance for 1102 & 1104 N Lakewood Ave –
Lott Property)**

TAX PARCEL ID: 07-22-28-0000-00-057 & 07-22-28-0000-00-060

CASE NO. AX-03-24-01: 1102 & 1104 N Lakewood Avenue - Lott Property Annexation

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 7.17 ACRES LOCATED AT 1102 AND 1104 NORTH LAKEWOOD AVENUE ON THE WEST SIDE OF NORTH LAKEWOOD AVENUE, APPROXIMATELY 946 FEET SOUTH OF WURST ROAD AT ITS INTERSECTION WITH NORTH LAKEWOOD AVENUE AND ASSIGNED PARCEL ID NUMBERS 07-22-28-0000-00-057 AND 07-22-28-0000-00-060, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, pursuant to Section 171.044, Florida Statutes, the owner of certain real properties located in unincorporated Orange County, Florida, as hereinafter described, has petitioned the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to annex approximately 7.17 acres of property, as more particularly described in **Exhibit “A”** attached hereto, into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, the Ocoee City Commission has determined that said petition bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, notice of the proposed annexation has been published pursuant to the requirements of Section 171.044(2), Florida Statutes, and Section 5-9(E), Article V, Land Development Code of the City of Ocoee (the “Code”); and

WHEREAS, on April 9, 2024, the Planning and Zoning Commission of the City of Ocoee, Florida, reviewed the proposed annexation and found it to be consistent with the Ocoee Comprehensive Plan, to comply with all applicable requirements of the Ocoee City Code, and to be in the best interest of the City of Ocoee and has recommended to the Ocoee City Commission that it approve said annexation petition; and

WHEREAS, the Ocoee City Commission has the authority, pursuant to Section 171.044, Florida Statutes, to annex said real property into its corporate limits upon petition of the owners of said real property; and

WHEREAS, the Ocoee City Commission is desirous of annexing and redefining the boundary lines of the City of Ocoee, Florida, to include said real property.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

Section 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida, Chapters 166 and 171, Florida Statutes, and Section C-7 of Article 1 of the Charter of the City of Ocoee, Florida.

Section 2. PETITION. The Ocoee City Commission hereby finds that the petition to annex certain lands, as hereinafter described, into the corporate limits of the City of Ocoee, Florida, bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida.

Section 3. ANNEXATION. The following described real property located in unincorporated Orange County, Florida, is hereby annexed into the corporate limits of the City of Ocoee, Florida:

**SEE EXHIBIT “A” ATTACHED HERETO AND BY THIS
REFERENCE MADE A PART HEREOF**

Section 4. MAP. A map of said land herein described, which clearly shows the annexed area, is attached hereto as **EXHIBIT “B”** and by this reference is made a part hereof.

Section 5. CONSISTENCY FINDING. The Ocoee City Commission hereby finds that the annexation of said land herein described is consistent with the Ocoee Comprehensive Plan, as amended, and meets all of the requirements for annexation set forth in Florida Statutes § 171.044, the Ocoee Comprehensive Plan and the Ocoee City Code.

Section 6. CORPORATE LIMITS. The corporate territorial limits of the City of Ocoee, Florida, are hereby redefined to include said land herein described and annexed.

Section 7. OFFICIAL MAPS. The City Clerk is hereby authorized to update and supplement official City maps of the City of Ocoee, Florida, to include said land herein described and annexed.

Section 8. LIABILITY. The land herein described and future inhabitants of said land herein described shall be liable for all debts and obligations and be subject to all species of taxation, laws, ordinances, and regulations of the City of Ocoee, Florida, and be entitled to the same privileges and benefits as other areas of the City of Ocoee, Florida.

Section 9. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of

competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

Section 10. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

Section 11. EFFECTIVE DATE. This Ordinance shall become effective upon passage and adoption. Thereafter, the City Clerk is hereby directed to file a certified copy of this Ordinance with the Clerk of the Circuit Court for Orange County, Florida, the Chief Administrative Officer of Orange County, Florida, and with the Florida Department of State within seven (7) days from the effective date.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTIONS

PARCEL ID NO.: 07-22-28-0000-00-057

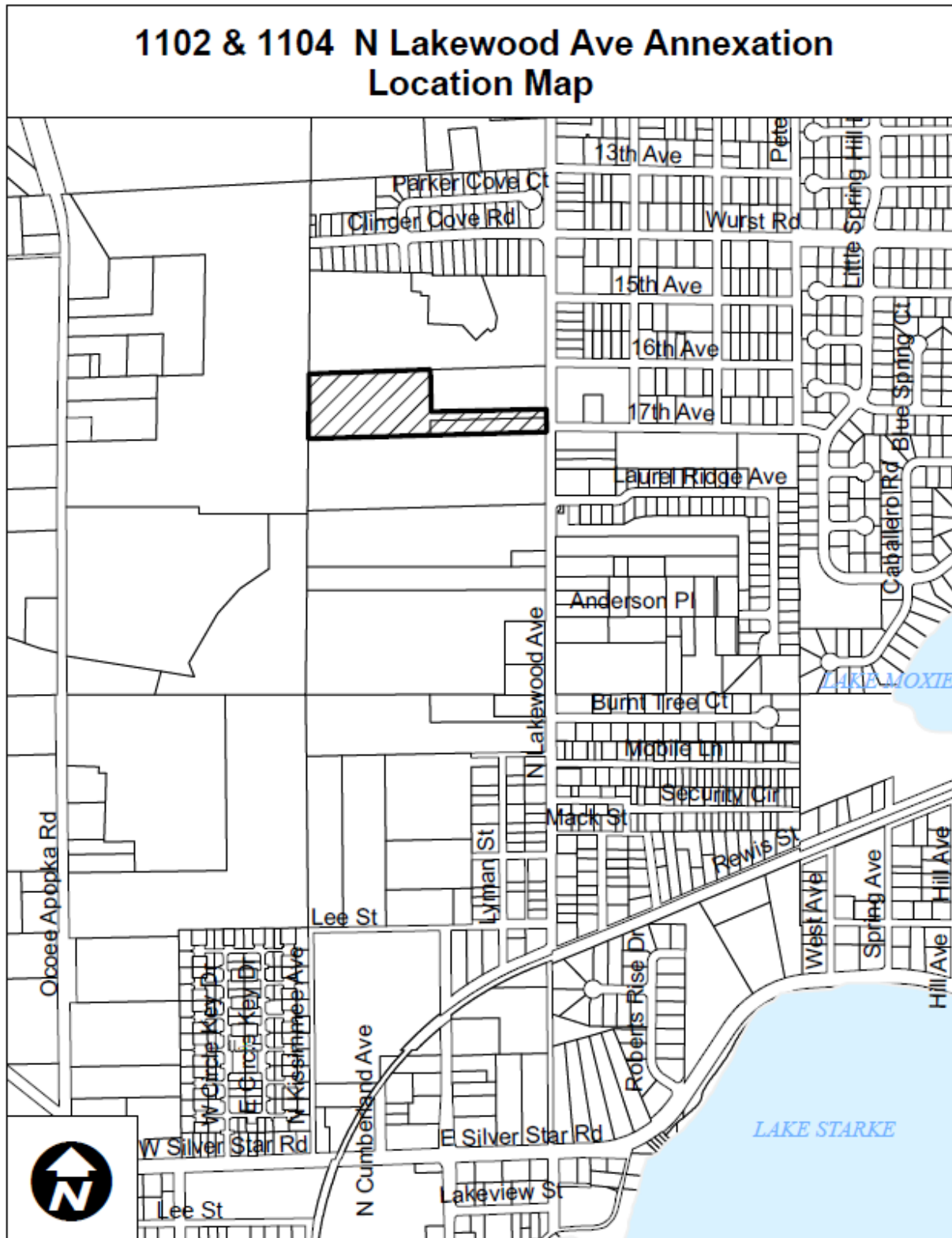
BEG SW COR NE1/4 OF SE1/4 N 349.5 FT E 663 FT S 353.9 FT W 663.8 FT TO POB & N 50 FT OF S 125 FT OF E1/2 OF NE1/4 OF SE1/4 OF SEC 07-22-28

PARCEL ID NO.: 07-22-28-0000-00-060

BEG AT SE COR OF NE1/4 OF SE1/4 RUN W 656 FT N 75 FT E 656 FT S 75 FT TO POB (LESS E 30 FT FOR R/W) IN SEC 07-22-28

EXHIBIT "B"

LOCATION MAP



West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

**CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
1102 & 1104 N. LAKEWOOD AVENUE – LOTT PROPERTY
ANNEXATION
CASE NUMBER: AX-03-24-01**

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-10, of the City of Ocoee Land Development Code that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOOE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider the Annexation for 1102 & 1104 N. Lakewood Avenue – Lott Property Annexation. The subject property consists of two (2) parcels assigned Parcel ID #s 07-22-28-0000-00-057 & 07-22-28-0000-00-060, and a combined total of approximately 7.17 acres. The properties are located on the west side of N. Lakewood Ave., approximately 946 feet south of Wurst Rd. at the intersection of N. Lakewood Ave.

ORDINANCE NO. 2024-15

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 7.17 ACRES LOCATED AT 1102 AND 1104 NORTH LAKEWOOD AVENUE ON THE WEST SIDE OF NORTH LAKEWOOD AVENUE, APPROXIMATELY 946 FEET SOUTH OF WURST ROAD AT ITS INTERSECTION WITH NORTH LAKEWOOD AVENUE AND ASSIGNED PARCEL ID NUMBERS 07-22-28-0000-00-057 AND 07-22-28-0000-00-060, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOOE COMPREHENSIVE PLAN, THE OCOOE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

If the applicant's request for annexation is approved, the annexation will incorporate the property into the City of Ocoee. Pursuant to Subsection 5-9 B. of the Land Development Code, the Planning Director has determined that the requested annexation is within the Ocoee-Orange County Joint Planning Area (JPA) and is consistent with the Ocoee-Orange County JPA Land Use Map and the Ocoee Comprehensive Plan.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 16, 2024

24-01547W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.



STAFF REPORT

Meeting Date: May 21, 2024

Item #: 14

Contact Name: Anoch Whitfield

Contact Number: Ext. 1016

Department Director: Michael Rumer

City Manager: Robert Frank

Subject: Second Reading of Ordinance for 1305 & 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property Annexation; Project No. AX-03-24-02. (Zoning Manager Whitfield)

Background Summary: First Reading of Ordinance held on May 7, 2024.

Owner/Applicant: The property owner is MDTL Enterprise LLC, represented by Jaime Douglas.

Site Location: The property is located in Commission District 3 and is on the east side of Ocoee Apopka Road, approximately 2,616 feet south of Fullers Cross Road at its intersection with Ocoee Apopka Road.

Property Size & Parcel Identification Number: The property consists of two (2) parcels totaling approximately 4.32 acres and assigned parcel ID numbers 07-22-28-0000-039 and 07-22-28-0000-00-041.

Existing Site Conditions: The table below summarizes the existing site conditions of the property.

Current Future Land Use Map (FLUM) Designation	Current Zoning District	Existing Land Use	Unique Features/Overlay Districts
Low Density Residential (per JPA)	County A-1 (Citrus Rural District)	Both parcels are vacant and generally used for agriculture purposes	None

The table below lists the jurisdictions, future land use designations, zoning districts, and existing uses of the surrounding properties.

Direction	Jurisdiction	Future Land Use Designation	Zoning	Existing Land Uses
North	City of Ocoee	Low Density Residential	R-1AA	Vacant, wooded parcel
South	Orange County	Low Density Residential	A-1	Agriculture operations

East	Orange County	Low Density Residential	A-1	Agriculture operations
West	City of Ocoee	Light Industrial	PUD-IND	Light Industrial/Flex Warehouse Development

Proposed Development: The applicant is requesting an annexation. The initial rezoning to a City zoning classification is not being processed at this time, and as of the date of this staff report, the applicant has not submitted a proposed plan for development.

Consistency with Florida Statutes: With respect to the proposed annexation, Section 171.044, Florida Statutes (F.S.), grants municipalities the authority to annex contiguous, compact, non-circuitous territory so long as it does not create an enclave. The subject property is bordered on its north and west sides by the City's jurisdictional limits and, as such, is contiguous to the City, and the annexation does not create an enclave. Instead, the annexation furthers the City's efforts to reduce existing enclaves within the city limits.

Consistency with JPA Agreement: The property is located within the Ocoee-Orange County Joint Planning Area (JPA), and the proposed annexation is consistent with the terms of the JPA Agreement.

Consistency with Adopted Comprehensive Plan: The annexation is consistent with Future Land Use Element (FLUE) Policy 2.5, which requires the City to consider requests for voluntary annexation when those lands are logical extensions of the existing City limits, when services can be adequately provided and when proposed uses are compatible with the City's Comprehensive Plan, the JPA Agreement, and the City's Annexation Policy.

Transportation and Access: The site is currently accessed by and will continue to be accessed by Ocoee Apopka Road. Because there is no corresponding rezoning or proposed increase in entitlements, a traffic impact analysis is not required at this time.

Utilities: The Utilities Department has no issues with this annexation.

Stormwater: Not applicable.

Schools: Not applicable.

Public Safety: Fire emergency service is available in under five (5) minutes with a flow rate of 1,000 gallons per minute. The property is located within Police Grid 1, with a four (4) minute response time. The nearest police station is 4 miles away, and the average non-emergency travel time is 11 minutes.

Recreation and Open Space: Not applicable.

For more details, please see the attached Annexation and Feasibility Analysis document.

Issue:

Should the Honorable Mayor and City Commissioners approve the proposed ordinance for the proposed Annexation of the 1305 and 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property, assigned parcel ID numbers 07-22-28-0000-00-039 and 07-22-28-0000-00-041?

Recommendations:

Development Review Committee (DRC) Recommendation

The DRC met on Tuesday, April 2, 2024, to consider this annexation, and identifying no issues, made a recommendation of approval.

Planning and Zoning Commission (PZC) Recommendation

The PZC met on Tuesday, April 9, 2024, to consider this annexation, and identifying no issues, made a recommendation of approval.

Staff Recommendation

Staff recommends the Honorable Mayor and City Commissioners approve the proposed ordinance for the Annexation of the 1305 and 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property, assigned parcel ID numbers 07-22-28-0000-00-039 and 07-22-28-0000-00-041.

Attachments:

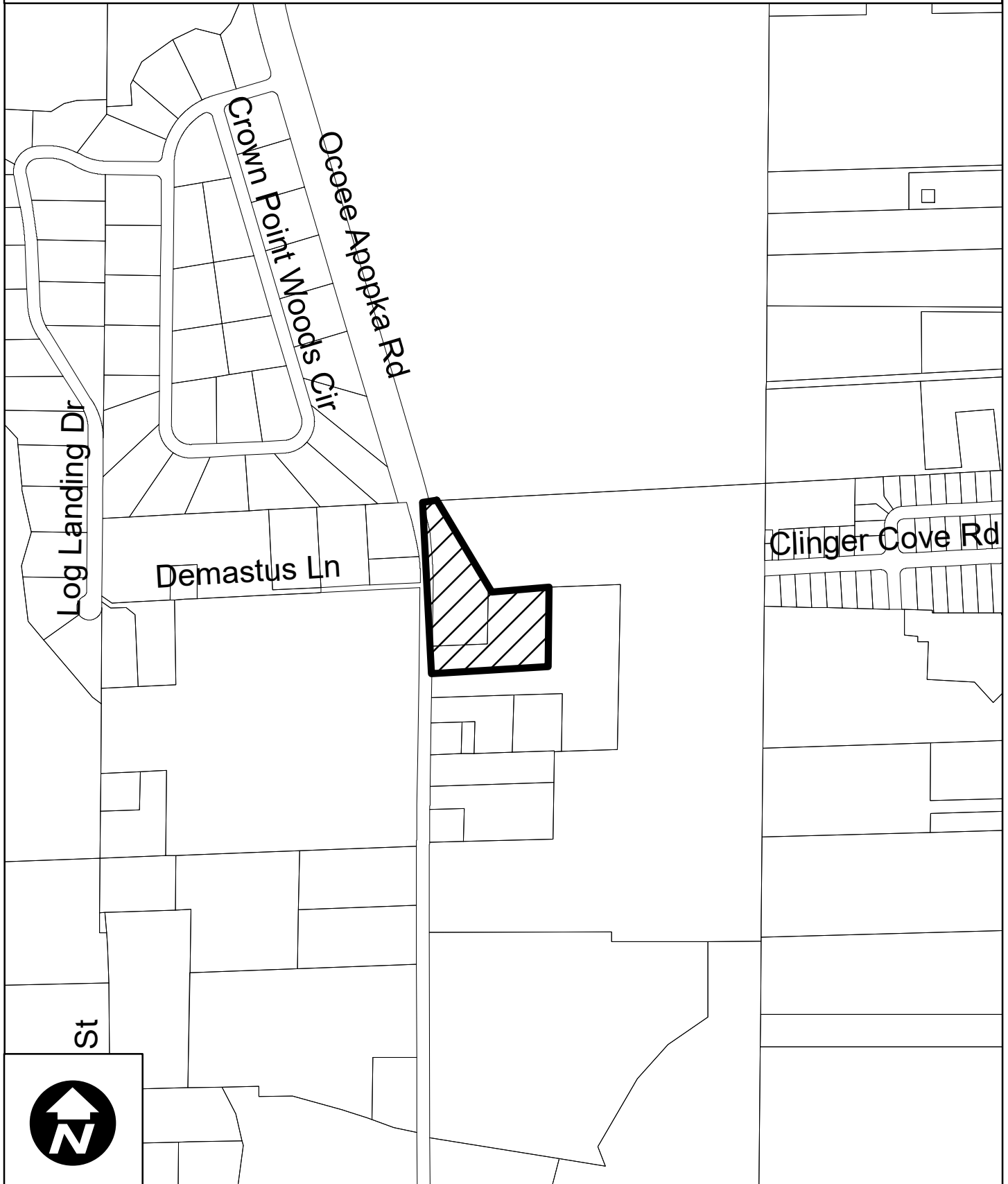
1. Location Map
2. Aerial Map
3. FLU Map
4. Zoning Map
5. Annexation and Rezoning Feasibility Report
6. Survey - Parcel 41
7. Survey - Parcel 39
8. 1305 & 1113 Ordinance
9. Advertisement

Financial Impacts:

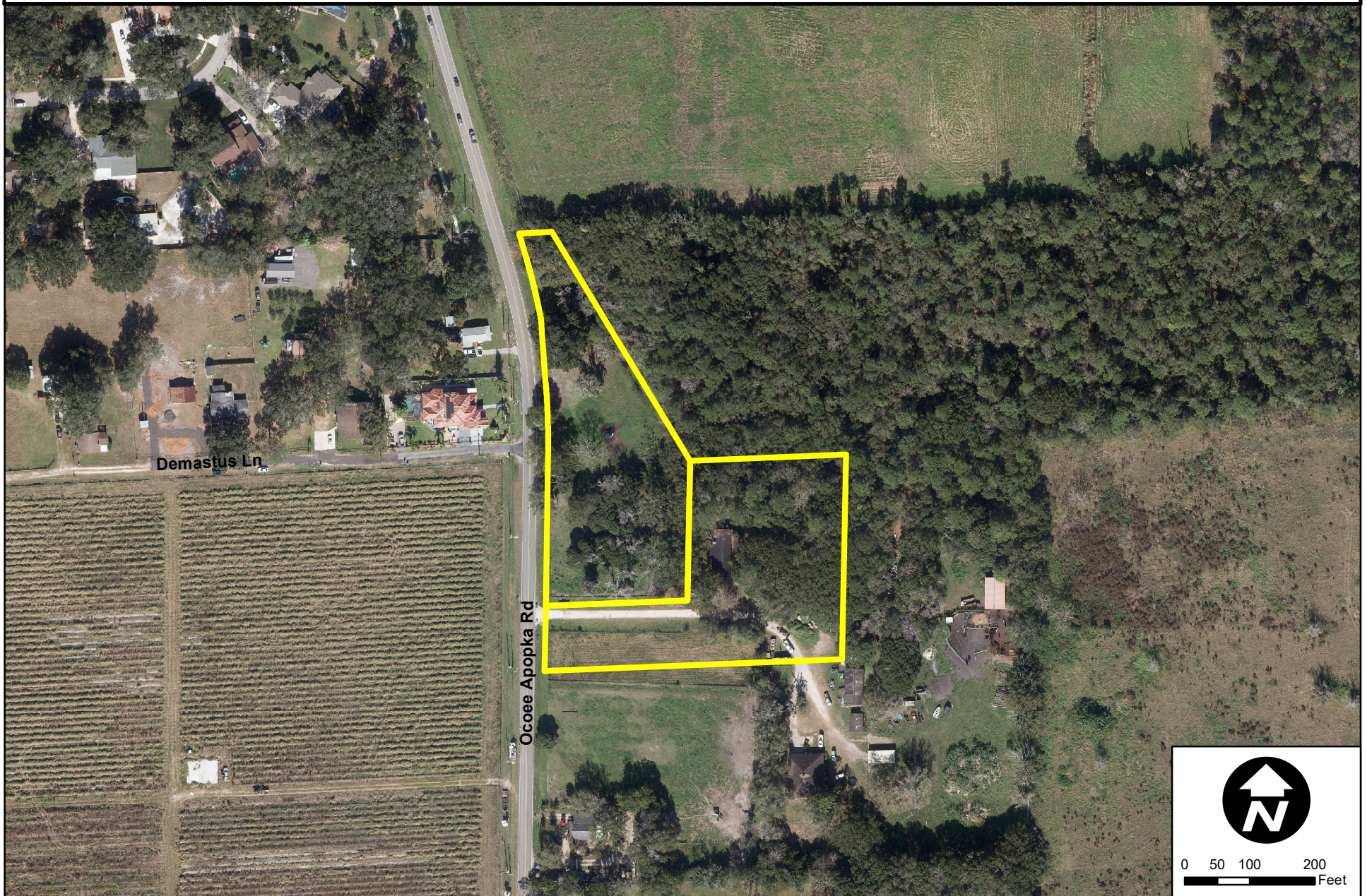
N/A

Type of Item: Second Reading Public Hearing

1305 & 1113 Ocoee Apopka Road Annexation Location Map



1305 & 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property 2022 Aerial Photography



0 50 100 200
Feet

1305 & 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property Surrounding Future Land Use Map



Ocoee
Development Services
Department

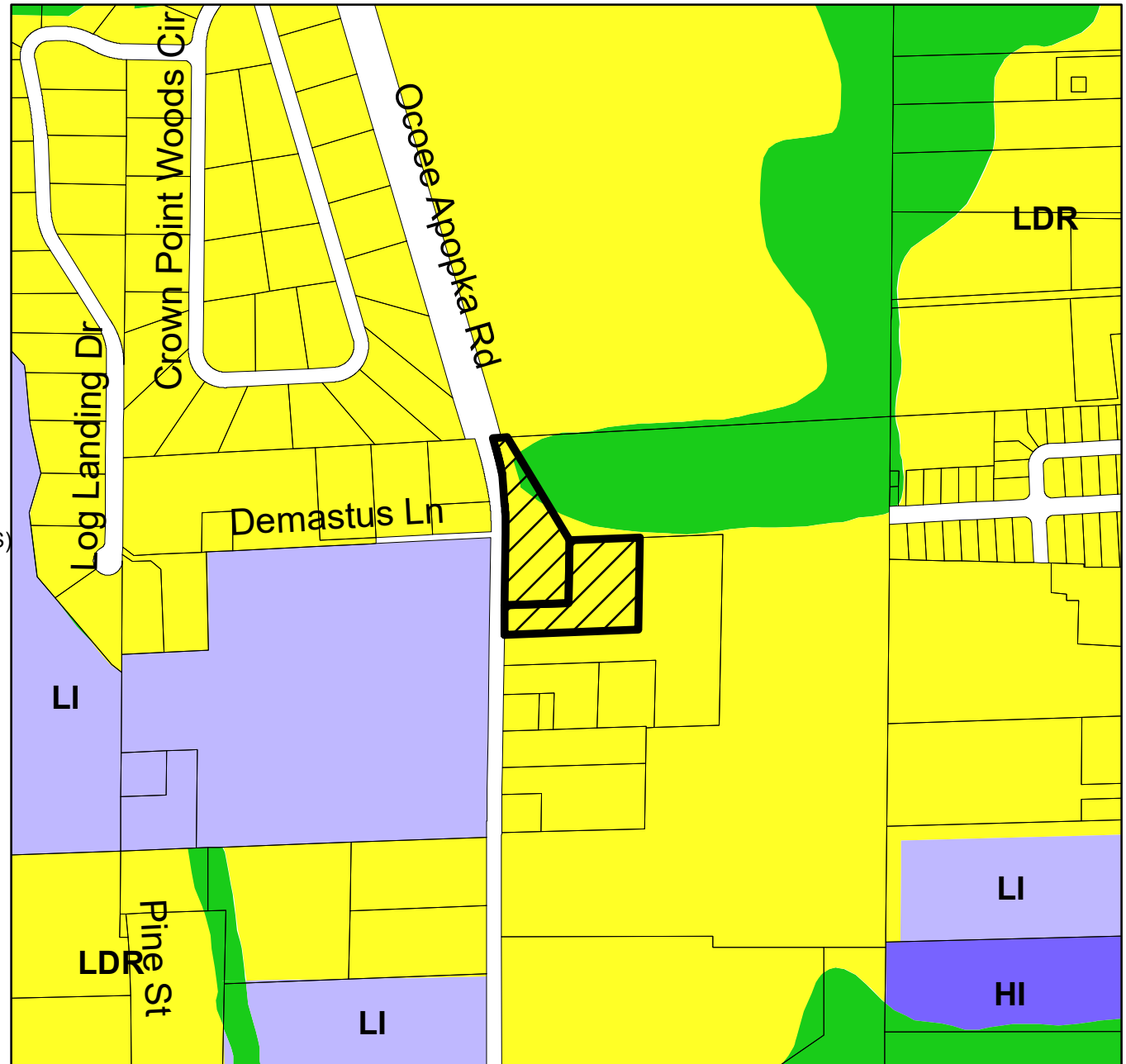
0 130 260 520
Feet

Created: month year

 Subject Property

Future Land Use Classification:

-  Low Density Residential (LDR)
-  Medium Density Residential (MDR)
-  High Density Residential (HDR)
-  Professional Offices and Services (PS)
-  Commercial (COMM)
-  Light Industrial (LI)
-  Heavy Industrial (HI)
-  Conservation/Floodplains (CONS)
-  Recreation and Open Space (REC)
-  Public Facilities/Institutional (INST)



1305 & 1113 Ocoee Apopka Road - MDTL Enterprise LLC Property Surrounding Zoning Map



Development Services
Department

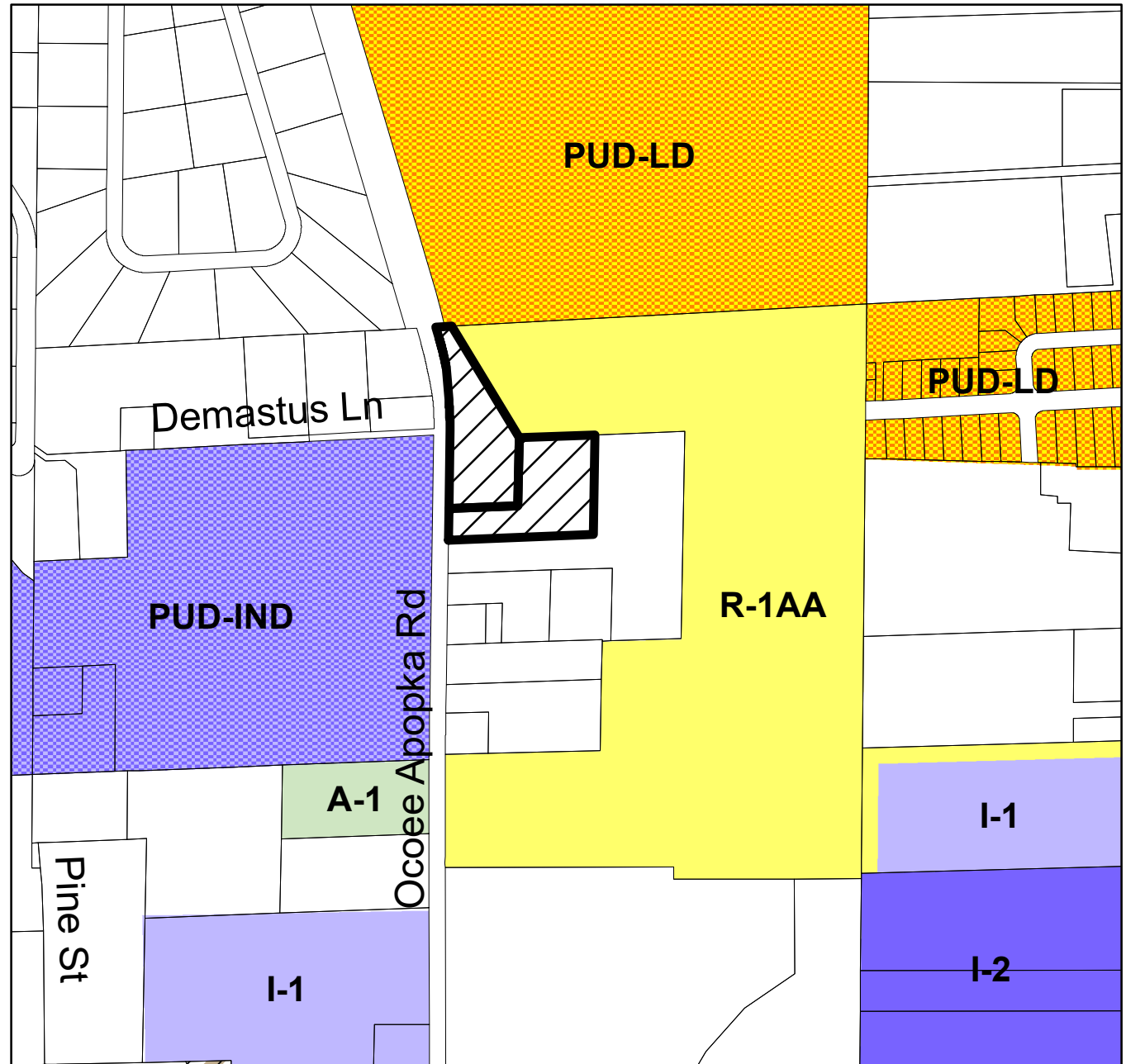
0 120 240 480
Feet

Created: month year

 Subject Property

Zoning Classification:

-  General Agricultural (A-1)
-  Suburban (A-2)
-  Single-Family Dwelling (R-1AAA)
-  Single-Family Dwelling (R-1AA)
-  Single-Family Dwelling (R-1A)
-  Single-Family Dwelling (R-1)
-  One- & Two-Family Dwelling (R-2)
-  Multiple-Family Dwelling (R-3)
-  Mobile Home Subdivision (RT-1)
-  Professional Offices & Services (P-S)
-  Neighborhood Shopping (C-1)
-  Community Commercial (C-2)
-  General Commercial (C-3)
-  Restricted Manufacturing & Warehousing (I-1)
-  General Industrial (I-2)
-  Commercial (PUD)
-  Low Density (PUD)
-  Medium Density (PUD)
-  High Density (PUD)
-  Public Use (PUD)
-  Unclassified



CITY OF OCOEE

ANNEXATION FEASIBILITY ANALYSIS

CASE NUMBER: AX-03-24-04 (SAGE # 2024-0016)

APPLICANT NAME: Jaime Douglas

PROJECT NAME: MDTL ENTERPRISE LLC PROPERTY ANNEXATION

This form is used to evaluate annexation requests to determine the feasibility of providing urban services to individual properties. Each department's findings are summarized below.

I. PLANNING DEPARTMENT

Anoch Whitfield, Zoning Manager

A. Applicant/Owner

1. Owner (if different from Applicant):	MTDL Enterprise, LLC
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B. Property Location

1. General Location:	The properties are generally located on the east side of Ocoee Apopka Rd., approximately 2,616 feet south of Fullers Cross Rd. at the intersection of Ocoee Apopka Rd.
2. Parcel Identification Number:	07-22-28-0000-00-039 & 07-22-28-0000-00-041
3. Street Addresses:	1305 & 1113 Ocoee Apopka Road
4. Size of Parcels:	4.32 acres (2 parcels)

C. Use Characteristics

1. Existing Use:	Both parcels are vacant and generally used for agriculture purposes
2. Proposed use:	No proposed use submitted to the City at this time
3. Density / Intensity:	N/A
4. Projected Population:	N/A

D. Zoning and Land Use

1. Orange County Future Land Use:	Low Density Residential per JPA FLUM
2. Orange County Zoning:	A-1
3. Existing Ocoee Future Land Use:	Low Density Residential per JPA FLUM
4. Proposed Ocoee Zoning:	None at this time. Site will retain County A-1 until rezoning occurs

E. Consistency

1. Joint Planning Area:	Yes
2. Comprehensive Plan:	Yes

II. FIRE DEPARTMENT

1. Estimated Response Time:	Average 5 minutes
2. Distance to Property:	
3. Fire Flow Requirements:	1,000 gallons per minute

III. POLICE DEPARTMENT

1. Police Patrol Zone / Grid / Area:	1
2. Estimated Response Time:	4 mins
3. Distance to Property:	4 miles
3. Average Travel Time	11 mins

IV. ECONOMIC VALUE	Anoch Whitfield, Zoning Manager
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1. Property Appraiser Market Value:	\$ 350,094 (combined)
2. Property Appraiser Taxable Value	\$ 175,853 (combined)
3. Estimated City Ad Valorem Taxes:	TBD
4. Anticipated Licenses & Permits:	TBD
5. Potential Impact Fees:	TBD
6. Total Project Revenues:	TBD

V. BUILDING DEPARTMENT	
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1. Within the 100-year Flood Plain:	No
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VI. UTILITIES	Jennifer Bolling, Engineering Manager
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A. Potable Water	
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1. In Ocoee Service Area:	Yes
2. City Capable of Serving Area:	Yes
3. Extension Needed:	No
4. Location and Size of Nearest Water Main:	To Be Determined

B. Sanitary Sewer	
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1. In Ocoee Service Area:	Yes
2. City Capable of Serving Area:	Yes
3. Extension Needed:	Yes
4. Location and Size of Nearest Force Main:	To Be Determined
5. Annexation Agreement Needed:	

C. Other	
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1. Utility Easement Needed:	Yes
2. Private Lift Station Needed:	Yes or as determined by Utilities Department
3. Well Protection Area Needed:	No

VII. TRANSPORTATION	Anoch Whitfield, Zoning Manager
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1. Paved Access:	Yes
2. ROW Dedication:	To be determined
3. Traffic Study:	Not required at this time for annexation
4. Traffic Analysis Zone:	

VIII. PRELIMINARY CONCURRENCY EVALUATION	
A. Transportation:	Full traffic impact analysis will be required prior to any non-residential development
B. Parks / Recreation:	Not applicable at this time
C. Water / Sewer:	Water is available; however, sewer is not available currently.
D. Stormwater:	To be provided on site at time of development
E. Solid Waste:	At this time, adequate solid waste capacity exists.
F. Impact Fees:	TBD at time of building permit

IX. SITE SPECIFIC ISSUES	All Departments
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X. CONSISTENCY WITH STATE ANNEXATION REGULATIONS	Anoch Whitfield, Zoning Manager
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The properties to be annexed border the City Limits on their north side; therefore, the annexation of these properties will further reduce the existing enclaves within the City limits. No part of the area to be annexed is included within the boundary of another municipality, and the properties being annexed will be developed for urban purposes. Therefore, this annexation is consistent with Section 171.043(1) & (2), Florida Statutes.

BEGIN 574.86 FEET SOUTH 1 DEGREE WEST FROM THE CENTER OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, ORANGE COUNTY, FLORIDA, RUN THENCE NORTH 89 DEGREES EAST 219.78 FEET, THENCE NORTH 1 DEGREE EAST 214.5 FEET, THENCE NORTH 87 DEGREES EAST 239.66 FEET, THENCE SOUTH 1 DEGREE WEST 314.53 FEET, THENCE SOUTH 87 DEGREES WEST 458.80 FEET, THENCE NORTH 100 FEET TO THE POINT OF BEGINNING, LESS THE WEST 30 FEET FOR ROAD RIGHT OF WAY.

BEARINGS SHOWN HEREON ARE BASED ON THE EAST RIGHT OF WAY LINE LINE OF OCOEE APOPKA ROAD AS BEING NORTH 00°49'08" EAST (AN ASSUMED BEARING FOR ANGULAR DESIGNATION ONLY)

THERE MAY BE EASEMENTS AND RESTRICTIONS OF RECORD AND/OR PRIVATE AGREEMENTS NOT FURNISHED TO THIS SURVEYOR OR SHOWN ON THIS BOUNDARY SURVEY THAT MAY AFFECT PROPERTY RIGHTS AND/OR LAND USE RIGHTS OF THE SUBJECT PROPERTY.

THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A COMMITMENT FOR TITLE INSURANCE.

THERE MAY BE ENVIRONMENTAL ISSUES AND/OR OTHER MATTERS REGULATED BY VARIOUS DEPARTMENTS OF FEDERAL, STATE OR LOCAL GOVERNMENTS AFFECTING THE SUBJECT PROPERTY NOT SHOWN ON THIS SURVEY.

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER OR AN ELECTRONIC SIGNATURE THAT IS IN COMPLIANCE WITH FLORIDA ADMINISTRATIVE CODE 5J-17.062.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, APPARENT AND/OR VISIBLE, UNOBSTRUCTED, ABOVE GROUND IMPROVEMENTS WERE LOCATED. UNDERGROUND IMPROVEMENTS, SUCH AS FOUNDATIONS AND UTILITIES, WERE NOT LOCATED, UNLESS NOTED OTHERWISE.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, THERE ARE NO APPARENT AND/OR UNOBSTRUCTED, ABOVE GROUND ENCROACHMENTS. THE DISPOSITION OF ANY POTENTIAL ENCROACHING IMPROVEMENTS SHOWN IS BEYOND THE PROFESSIONAL PURVIEW OF THE SURVEYOR AND SUBJECT TO LEGAL INTERPRETATION.

THE ACCURACY OF THE SURVEY MEASUREMENTS USED FOR THIS SURVEY MEETS OR EXCEEDS THE EXPECTED USE OF THE PROPERTY DESCRIBED HEREON. (SUBURBAN) 1 FOOT IN 7,500 FEET.

CONC	CONCRETE		OVERHEAD ELECTRIC
E/P	EDGE OF PAVEMENT		FENCE LINE AS NOTED
PB	PLAT BOOK		
PG(S)	PAGE(S)		TOE OF SLOPE
LB	LICENSED BUSINESS		
R/W	RIGHT OF WAY		
PID	PARCEL IDENTIFICATION NUMBER		
RCP	REINFORCED CONCRETE PIPE		
C&G	CURB AND GUTTER		
CLF	CHAIN LINK FENCE		
IRC	IRON ROD & CAP		
(D)	DEED		
(M)	MEASURED		
(C)	CALCULATED		
			
			
			
			
			
			
			
			
			
			

	SINGLE STAND SIGN
	WOODEN POWER POLE
	GUY WIRE
	FOUND IRON ROD OR PIPE AS NOTED
	SET 1/2" IRON ROD OR NAIL & DISK
	MAILBOX

[illegible]

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16 EAST PLANT STREET
WINTER GARDEN, FLORIDA 34787
(407) 654-5355 LB#6723

AECOM

FOR:

FOR THE LICENSED BUSINESS #6723 BY:

JAMES L. RICKMAN, P.S.M. #5633

[illegible]

JOB #: 20230899
DATE: 03/08/2024
SCALE: 1" = 30'
CALC BY: DY
FIELD BY: TS
DRAWN BY: MCD
CHECKED BY: DY

SHEET 1 OF 1

LEGAL DESCRIPTION:
BEGINNING ON THE WEST BOUNDARY OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, ORANGE COUNTY, FLORIDA, AT A POINT 31.60 CHAINS NORTH OF THE QUARTER SECTION POST STANDING ON THE SOUTH BOUNDARY OF SAID SECTION 7, RUN EAST 3.33 CHAINS; THENCE NORTH 3.25 CHAINS; THENCE NORTHWESTWARDLY TO THE NORTHWEST CORNER OF THE SAID NORTHWEST QUARTER OF THE SOUTHEAST QUARTER; THENCE SOUTH 8.71 CHAINS, MORE OR LESS, TO PLACE OF BEGINNING.

BEGINNING AT THE NORTHWEST CORNER OF THE SOUTHEAST QUARTER OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, RUN THENCE WEST 83 FEET TO A POINT ON THE CENTER LINE OF THE OCOEE-APOPKA HARD ROAD; THENCE SOUTHERLY ALONG THE CENTER LINE OF SAID ROAD, A DISTANCE OF 303.7 FEET; THENCE NORTH 88 DEGREES 35 MINUTES EAST 197.95 FEET; THENCE NORTH 27 DEGREES 01 MINUTES WEST 331.52 FEET TO THE POINT OF BEGINNING, LESS THE RIGHT OF WAY OF OCOEE-APOPKA HARD ROAD.

BEARINGS SHOWN HEREON ARE BASED ON THE WEST LINE OF THE SOUTHEAST 1/4 OF SECTION 07-22 SOUTH, RANGE 28 EAST AS BEING SOUTH 01°04'14" WEST (AN ASSUMED BEARING FOR ANGULAR DESIGNATION ONLY)

SYMBOLS SHOWN HEREON ARE NOT TO SCALE, AND MAY BE ALTERED FROM THEIR ORIGINAL POSITION FOR VISUAL PURPOSES ONLY.

THERE MAY BE ENVIRONMENTAL ISSUES AND/OR OTHER MATTERS REGULATED BY VARIOUS DEPARTMENTS OF FEDERAL, STATE OR LOCAL GOVERNMENTS AFFECTING THE SUBJECT PROPERTY NOT SHOWN ON THIS SURVEY.

ADJOINING PARCEL OWNER AND RECORDING INFORMATION DELINEATED HEREON WAS OBTAINED FROM THE ORANGE COUNTY PROPERTY APPRAISER'S PUBLIC WEBSITE.

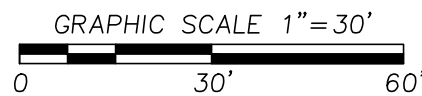
THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER OR AN ELECTRONIC SIGNATURE THAT IS IN COMPLIANCE WITH FLORIDA ADMINISTRATIVE CODE 5J-17.062.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, THERE ARE NO APPARENT AND/OR UNOBSTRUCTED, ABOVE GROUND ENCROACHMENTS. THE DISPOSITION OF ANY POTENTIAL ENCROACHING IMPROVEMENTS SHOWN IS BEYOND THE PROFESSIONAL PURVIEW OF THE SURVEYOR AND SUBJECT TO LEGAL INTERPRETATION.

THE ACCURACY OF THE SURVEY MEASUREMENTS USED FOR THIS SURVEY MEETS OR EXCEEDS THE EXPECTED USE OF THE PROPERTY DESCRIBED HEREON. (SUBURBAN) 1 FOOT IN 7,500 FEET.



CONC	CONCRETE		OVERHEAD ELECTRIC
E/P	EDGE OF PAVEMENT		FENCE LINE AS NOTED
PB	PLAT BOOK		TOP OF BANK
PG(S)	PAGE(S)		TOE OF SLOPE
LB	LICENSED BUSINESS		
R/W	RIGHT OF WAY		SINGLE STAND SIGN
PID	PARCEL IDENTIFICATION NUMBER		WOODEN POWER POLE
RCP	REINFORCED CONCRETE PIPE		GUY WIRE
C&G	CURB AND GUTTER		FOUND IRON ROD OR PIPE AS NOTED
CLF	CHAIN LINK FENCE		SET 1/2" IRON ROD OR NAIL & DISK LB#6723
IRC	IRON ROD & CAP		MAILBOX
HWF	HOG WIRE FENCE		
CMP	CORRUGATED METAL PIPE		ASPHALT
PVC	POLYVINYL CHLORIDE		DIRT/GRAVEL
(D)	DEED		DIRT/GRAVEL
(M)	MEASURED		
P.C.	POINT OF CURVATURE		
P.T.	POINT OF TANGENCY		
N.T.	NOT TANGENT		



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WINTER GARDEN, FLORIDA 3478
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BOUNDARY SURVEY
OF
PARCEL ID: 07-22-28-0000-00-039
SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST
ORANGE COUNTY, FLORIDA

FOR:

AECOM

FOR THE LICENSED BUSINESS #6723 BY:

JAMES I RICKMAN P S M #5633

A blank grid for drawing a picture, consisting of 10 columns and 10 rows of squares.

JOB #: 20230899
DATE: 03/08/2024
SCALE: 1" = 50'
CALC BY: DY
FIELD BY: TS
DRAWN BY: MCD
CHECKED BY: DY

SHEET 1 OF 1

**ORDINANCE NO. 2024-
(Annexation Ordinance for 1305 & 1113 Ocoee Apopka Rd –
MDTL Enterprise LLC Property)**

**TAX PARCEL ID: 07-22-28-0000-00-039 &
07-22-28-0000-00-041**

**CASE NO. AX-03-24-02: 1305 & 1113 Ocoee Apopka Road –
MDTL Enterprise LLC Annexation**

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 4.32 ACRES LOCATED AT 1305 AND 1113 OCOEE APOPKA ROAD APPROXIMATELY 2,616 FEET SOUTH OF FULLERS CROSS ROAD AT ITS INTERSECTION WITH NORTH LAKEWOOD AVENUE AND ASSIGNED PARCEL ID NUMBERS 07-22-28-0000-00-039 AND 07-22-28-0000-00-041, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, pursuant to Section 171.044, Florida Statutes, the owner of certain real properties located in unincorporated Orange County, Florida, as hereinafter described, has petitioned the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to annex approximately 4.32 acres of property, as more particularly described in **Exhibit “A”** attached hereto, into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, the Ocoee City Commission has determined that said petition bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, notice of the proposed annexation has been published pursuant to the requirements of Section 171.044(2), Florida Statutes, and Section 5-9(E), Article V, Land Development Code of the City of Ocoee (the “Code”); and

WHEREAS, on April 9, 2024, the Planning and Zoning Commission of the City of Ocoee, Florida, reviewed the proposed annexation and found it to be consistent with the Ocoee Comprehensive Plan, to comply with all applicable requirements of the Ocoee City Code, and to be in the best interest of the City of Ocoee and has recommended to the Ocoee City Commission that it approve said annexation petition; and

WHEREAS, the Ocoee City Commission has the authority, pursuant to Section 171.044, Florida Statutes, to annex said real property into its corporate limits upon petition of the owners of said real property; and

WHEREAS, the Ocoee City Commission is desirous of annexing and redefining the boundary lines of the City of Ocoee, Florida, to include said real property.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

Section 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida, Chapters 166 and 171, Florida Statutes, and Section C-7 of Article 1 of the Charter of the City of Ocoee, Florida.

Section 2. PETITION. The Ocoee City Commission hereby finds that the petition to annex certain lands, as hereinafter described, into the corporate limits of the City of Ocoee, Florida, bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida.

Section 3. ANNEXATION. The following described real property located in unincorporated Orange County, Florida, is hereby annexed into the corporate limits of the City of Ocoee, Florida:

**SEE EXHIBIT “A” ATTACHED HERETO AND BY THIS
REFERENCE MADE A PART HEREOF**

Section 4. MAP. A map of said land herein described, which clearly shows the annexed area, is attached hereto as **EXHIBIT “B”** and by this reference is made a part hereof.

Section 5. CONSISTENCY FINDING. The Ocoee City Commission hereby finds that the annexation of said land herein described is consistent with the Ocoee Comprehensive Plan, as amended, and meets all of the requirements for annexation set forth in Florida Statutes § 171.044, the Ocoee Comprehensive Plan and the Ocoee City Code.

Section 6. CORPORATE LIMITS. The corporate territorial limits of the City of Ocoee, Florida, are hereby redefined to include said land herein described and annexed.

Section 7. OFFICIAL MAPS. The City Clerk is hereby authorized to update and supplement official City maps of the City of Ocoee, Florida, to include said land herein described and annexed.

Section 8. LIABILITY. The land herein described and future inhabitants of said land herein described shall be liable for all debts and obligations and be subject to all species of taxation, laws, ordinances, and regulations of the City of Ocoee, Florida, and be entitled to the same privileges and benefits as other areas of the City of Ocoee, Florida.

Section 9. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of

competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

Section 10. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

Section 11. EFFECTIVE DATE. This Ordinance shall become effective upon passage and adoption. Thereafter, the City Clerk is hereby directed to file a certified copy of this Ordinance with the Clerk of the Circuit Court for Orange County, Florida, the Chief Administrative Officer of Orange County, Florida, and with the Florida Department of State within seven (7) days from the effective date.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTIONS

PARCEL ID NO.: 07-22-28-0000-00-039

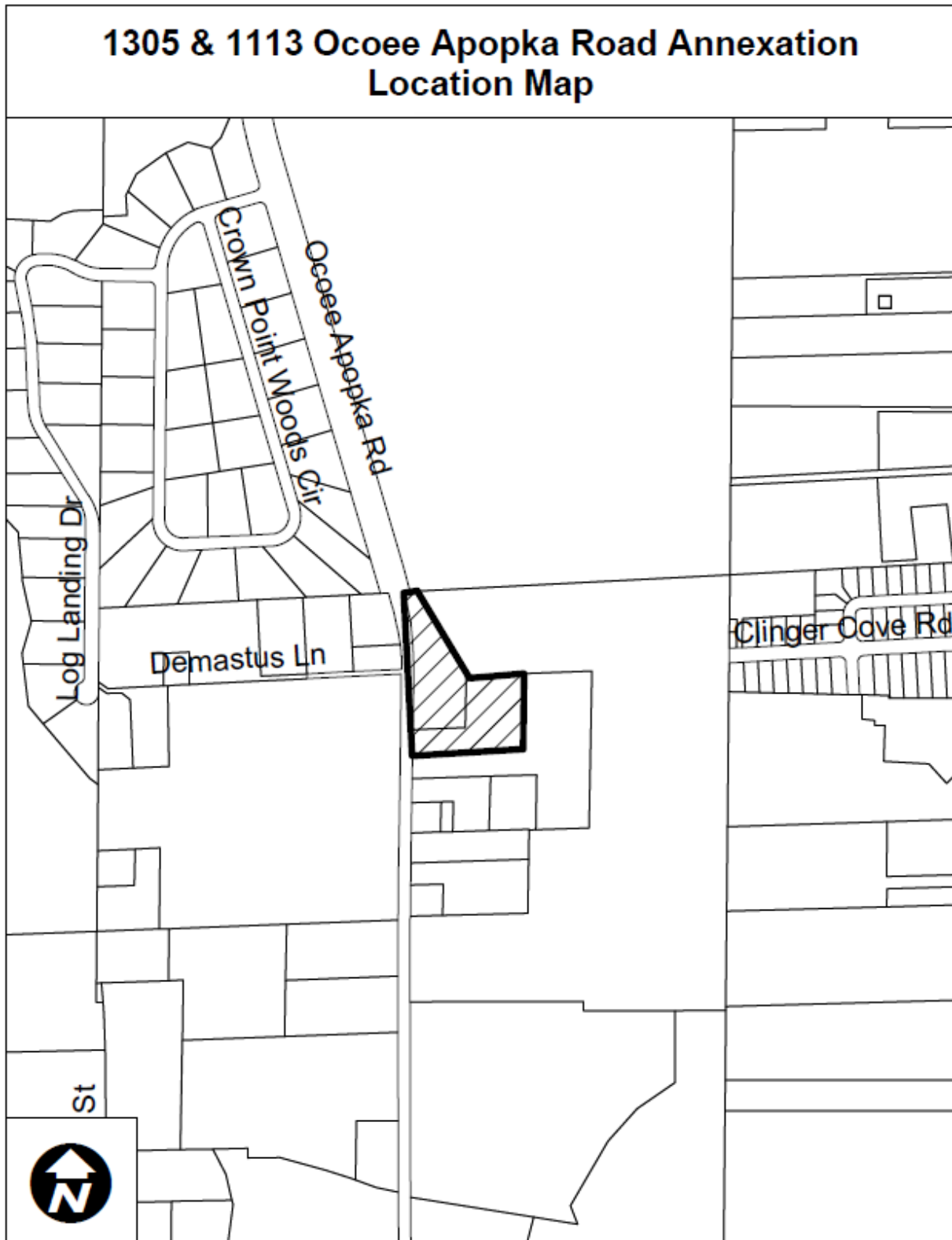
BEG NW COR OF SE1/4 RUN S 8.71 CHS E 3.33 CHS N 3.35 CHS NWLY TO BEG & NE1/4 OF SW1/4 E
OF RD SEC 07-22-28

PARCEL ID NO.: 07-22-28-0000-00-041

BEG 574.86 FT S 1 DEG W FROM CENTER OF SEC RUN N 87 DEG E 219.78 FT N 1 DEG E 214.5 FT N
87 DEG E 239.66 FT TH S 1 DEG W 314.53 FT S 87 DEG W 458.80 FT N 100 FT TO POB (LESS W 30 FT
RD R/W) IN SEC 07-22-28

EXHIBIT "B"

LOCATION MAP



West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
1305 & 1113 OCOEE APOPKA ROAD –
MDTL ENTERPRISE LLC PROPERTY
ANNEXATION
CASE NUMBER: AX-03-24-02

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-10, of the City of Ocoee Land Development Code that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider the Annexation for 1305 & 1113 Ocoee Apopka Road – MDTL Enterprise LLC Property Annexation. The subject property consists of two (2) parcels assigned Parcel ID #s 07-22-28-0000-00-039 & 07-22-28-0000-00-041 and a combined total of approximately 4.32 acres. The properties are located on the east side of Ocoee Apopka Rd., approximately 2,616 feet south of Fullers Cross Rd. at the intersection of Ocoee Apopka Rd.

ORDINANCE NO. 2024-13

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 4.32 ACRES LOCATED AT 1305 AND 1113 OCOEE APOPKA ROAD APPROXIMATELY 2,616 FEET SOUTH OF FULLERS CROSS ROAD AT ITS INTERSECTION WITH NORTH LAKEWOOD AVENUE AND ASSIGNED PARCEL ID NUMBERS 07-22-28-0000-00-039 AND 07-22-28-0000-00-041, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

If the applicant's request for annexation is approved, the annexation will incorporate the property into the City of Ocoee. Pursuant to Subsection 5-9 B. of the Land Development Code, the Planning Director has determined that the requested annexation is within the Ocoee-Orange County Joint Planning Area (JPA) and is consistent with the Ocoee-Orange County JPA Land Use Map and the Ocoee Comprehensive Plan.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 16, 2024

24-01545W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.



STAFF REPORT

Meeting Date: May 21, 2024

Item #: 15

Contact Name: Anoch Whitfield

Contact Number: Ext. 1016

Department Director: Michael Rumer

City Manager: Robert Frank

Subject: Second Reading of Ordinance for MDTL Enterprise LLC Property Annexation; Project No. AX-03-24-04. (Zoning Manager Whitfield)

Background Summary: First Reading of Ordinance held on May 7, 2024.

Owner/Applicant: The property owner is MDTL Enterprise LLC, represented by Jaime Douglas.

Site Location: The property is located in Commission District 3 and is on the east side of Ocoee Apopka Road, approximately 3,392 feet south of Fullers Cross Road at its intersection with Ocoee Apopka Road.

Property Size & Parcel Identification Number: The property consists of two (2) parcels totaling approximately 2.17 acres and assigned parcel ID numbers 07-22-28-0000-074 and 07-22-28-0000-00-105.

Existing Site Conditions: The table below summarizes the existing site conditions of the property.

Current Future Land Use Map (FLUM) Designation	Current Zoning District	Existing Land Use	Unique Features/Overlay Districts
Low Density Residential (per JPA)	County A-1 (Citrus Rural District)	Parcel 074 contains a house, and Parcel 105 is vacant.	None

The table below lists the jurisdictions, future land use designations, zoning districts, and existing uses of the surrounding properties.

Direction	Jurisdiction	Future Land Use Designation	Zoning	Existing Land Uses
North	Orange County	Low Density Residential	A-1	Agriculture operations
South	Orange County	Low Density Residential	A-1	Single family residential use

East	Orange County	Low Density Residential	A-1	Agriculture operations
West	Orange County on SW portion of site & City of Ocoee on west side of Ocoee Apopka Road	Light Industrial and Low Density Residential	A-1 for County property and PUD-IND for City property	Single family residential immediate adjacent and Light Industrial/Flex Warehouse Development on west side of Ocoee Apopka Road

Proposed Development: The applicant is requesting an annexation. The initial rezoning to a City zoning classification is not being processed at this time, and as of the date of this staff report, the applicant has not submitted a proposed plan for development.

Consistency with Florida Statutes: With respect to the proposed annexation, Section 171.044, Florida Statutes (F.S.), grants municipalities the authority to annex contiguous, compact, non-circuitous territory so long as it does not create an enclave. The subject property is bordered on its west side by the City's jurisdictional limits and, as such, is contiguous to the City, and the annexation does not create an enclave. Instead, the annexation furthers the City's efforts to reduce existing enclaves within the city limits.

Consistency with JPA Agreement: The property is located within the Ocoee-Orange County Joint Planning Area (JPA), and the proposed annexation is consistent with the terms of the JPA Agreement.

Consistency with Adopted Comprehensive Plan: The annexation is consistent with Future Land Use Element (FLUE) Policy 2.5, which requires the City to consider requests for voluntary annexation when those lands are logical extensions of the existing City limits, when services can be adequately provided and when proposed uses are compatible with the City's Comprehensive Plan, the JPA Agreement, and the City's Annexation Policy.

Transportation and Access: The site is currently accessed by and will continue to be accessed by Ocoee Apopka Road. Because there is no corresponding rezoning or proposed increase in entitlements, a traffic impact analysis is not required at this time.

Utilities: The Utilities Department has no issues with this annexation.

Stormwater: Not applicable.

Schools: Not applicable.

Public Safety: Fire emergency service is available in under five (5) minutes with a flow rate of 1,000 gallons per minute. The property is located within Police Grid 1, with a four (4) minute response time. The nearest police station is 4 miles away, and the average non-emergency travel time is 11 minutes.

Recreation and Open Space: Not applicable.

For more details, please see the attached Annexation and Feasibility Analysis document.

Issue:

Should the Honorable Mayor and City Commissioners approve the proposed ordinance for the Annexation of the MDTL Enterprise LLC Property, assigned parcel ID numbers 07-22-28-0000-00-074 and 07-22-28-0000-00-105?

Recommendations:**Development Review Committee (DRC) Recommendation**

The DRC met on Tuesday, April 2, 2024, to consider this annexation, and identifying no issues, made a recommendation of approval.

Planning and Zoning Commission (PZC) Recommendation

The PZC met on Tuesday, April 9, 2024, to consider this annexation, and identifying no issues, made a recommendation of approval.

Staff Recommendation

Staff recommends the Honorable Mayor and City Commissioners approve the proposed ordinance for the Annexation of the MDTL Enterprise LLC Property, assigned parcel ID numbers 07-22-28-0000-00-074 and 07-22-28-0000-00-105.

Attachments:

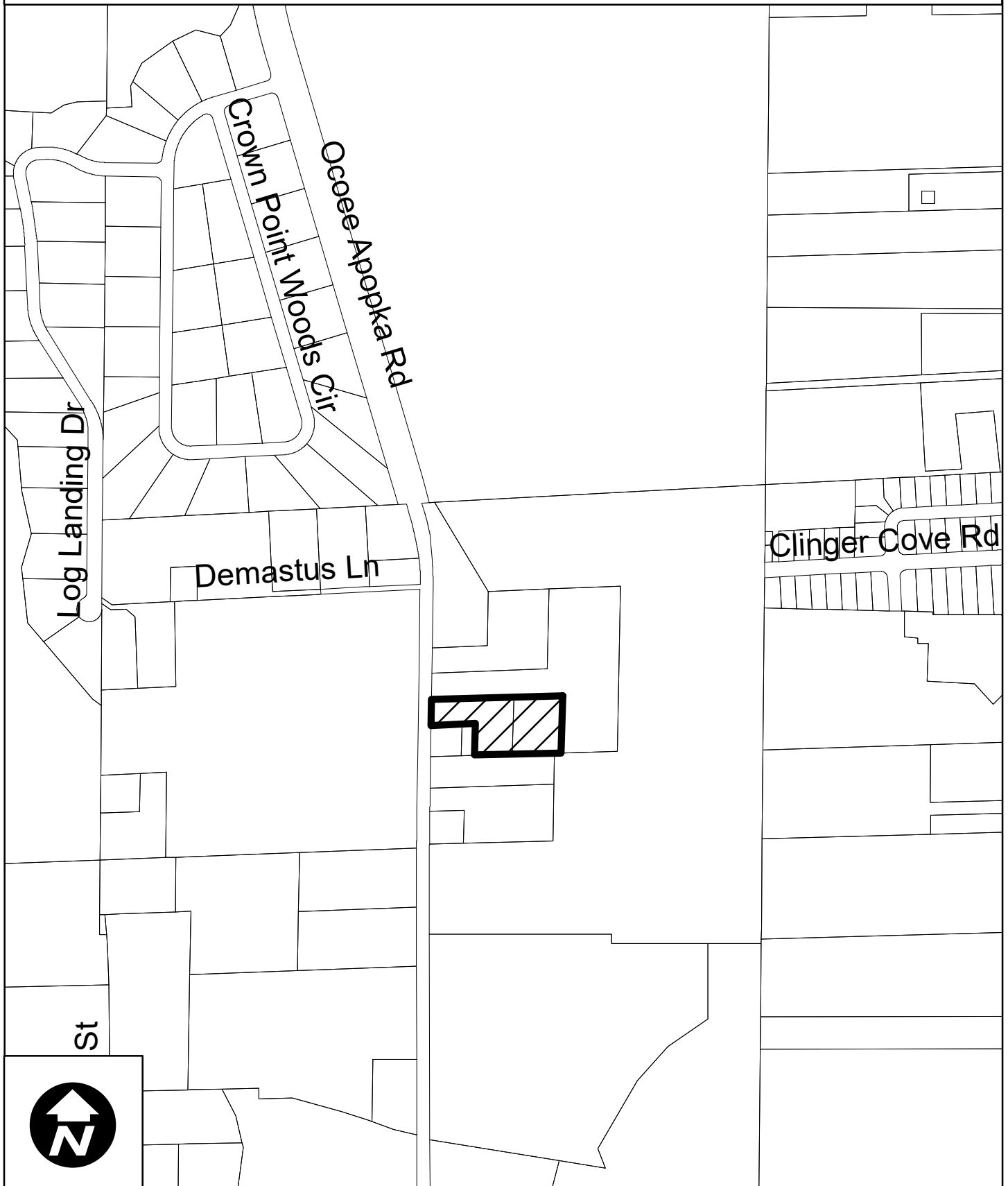
1. Location Map
2. Aerial Map
3. FLU Map
4. Zoning Map
5. Survey - Parcels 105 and 74
6. MDTL Ordinance
7. Advertisement

Financial Impacts:

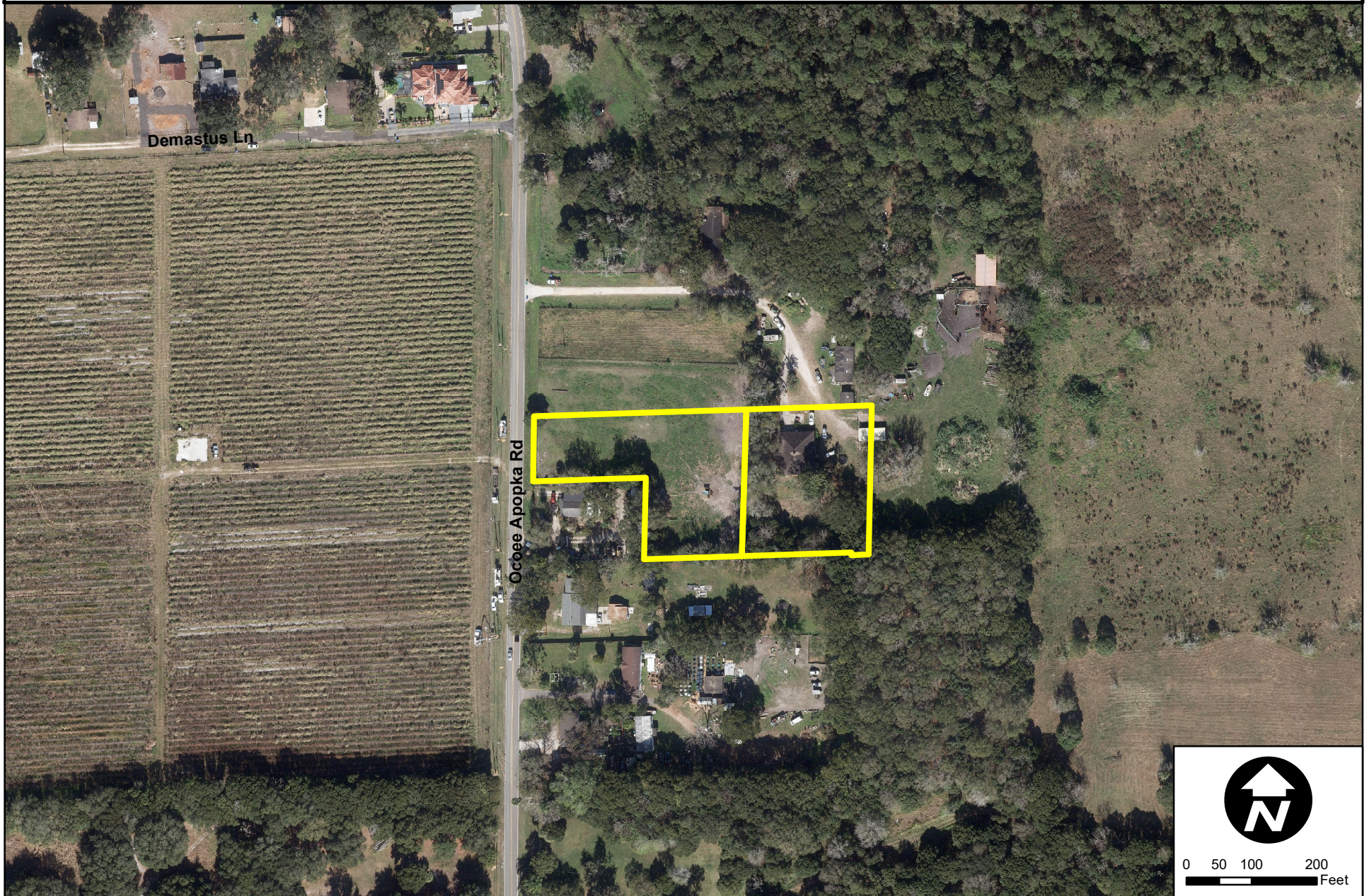
N/A

Type of Item: Second Reading Public Hearing

1053 Ocoee Apopka Road Annexation Location Map



1053 Ocoee Apopka Road - MDTL Enterprise LLC Property 2022 Aerial Photography



1053 Ocoee Apopka Road - MDTL Enterprise LLC Property Surrounding Future Land Use Map



Ocoee
Development Services
Department

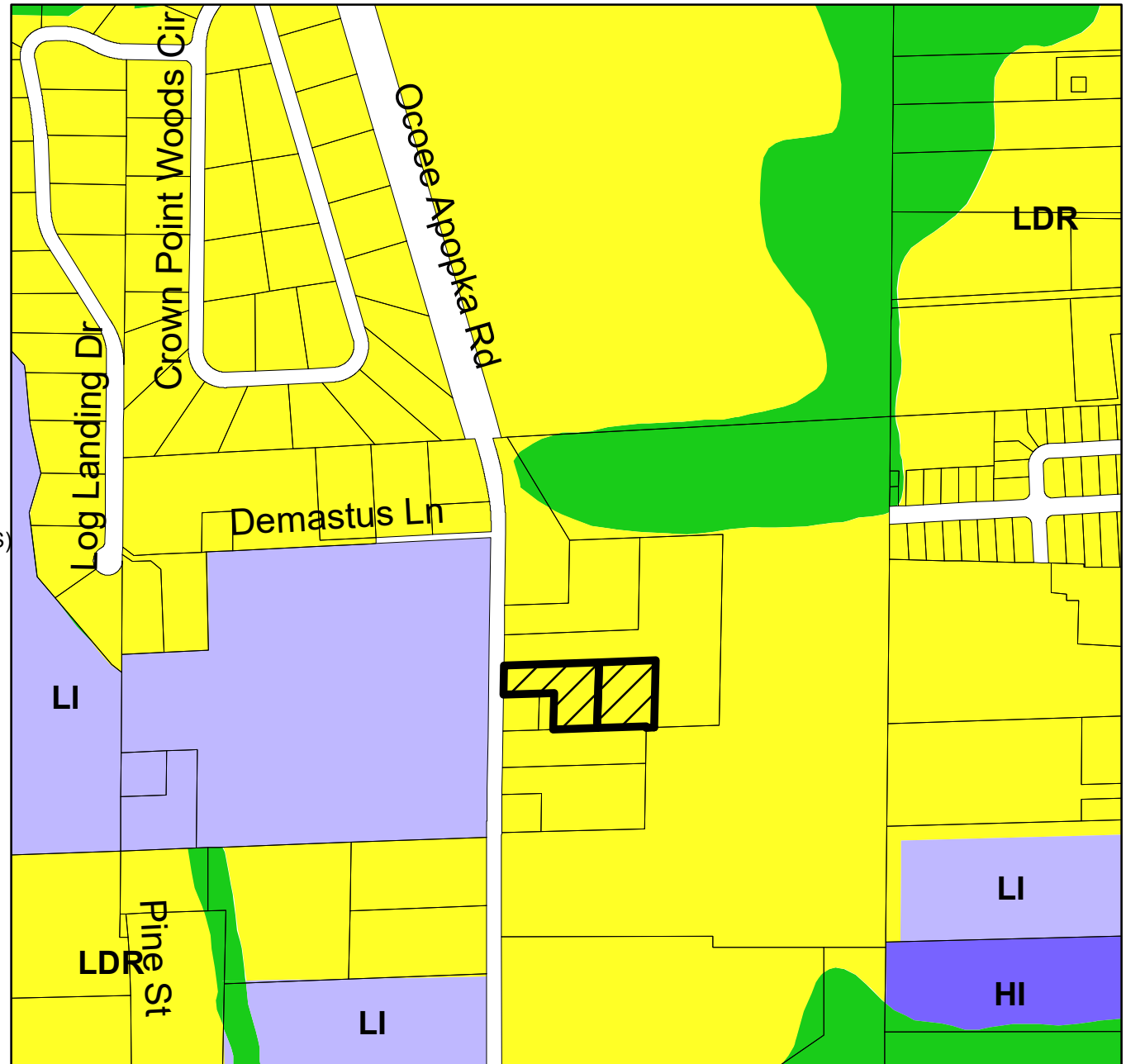
0 130 260 520
Feet

Created: month year

 Subject Property

Future Land Use Classification:

-  Low Density Residential (LDR)
-  Medium Density Residential (MDR)
-  High Density Residential (HDR)
-  Professional Offices and Services (PS)
-  Commercial (COMM)
-  Light Industrial (LI)
-  Heavy Industrial (HI)
-  Conservation/Floodplains (CONS)
-  Recreation and Open Space (REC)
-  Public Facilities/Institutional (INST)



1053 Ocoee Apopka Road - MDTL Enterprise LLC Property Surrounding Zoning Map



Development Services
Department

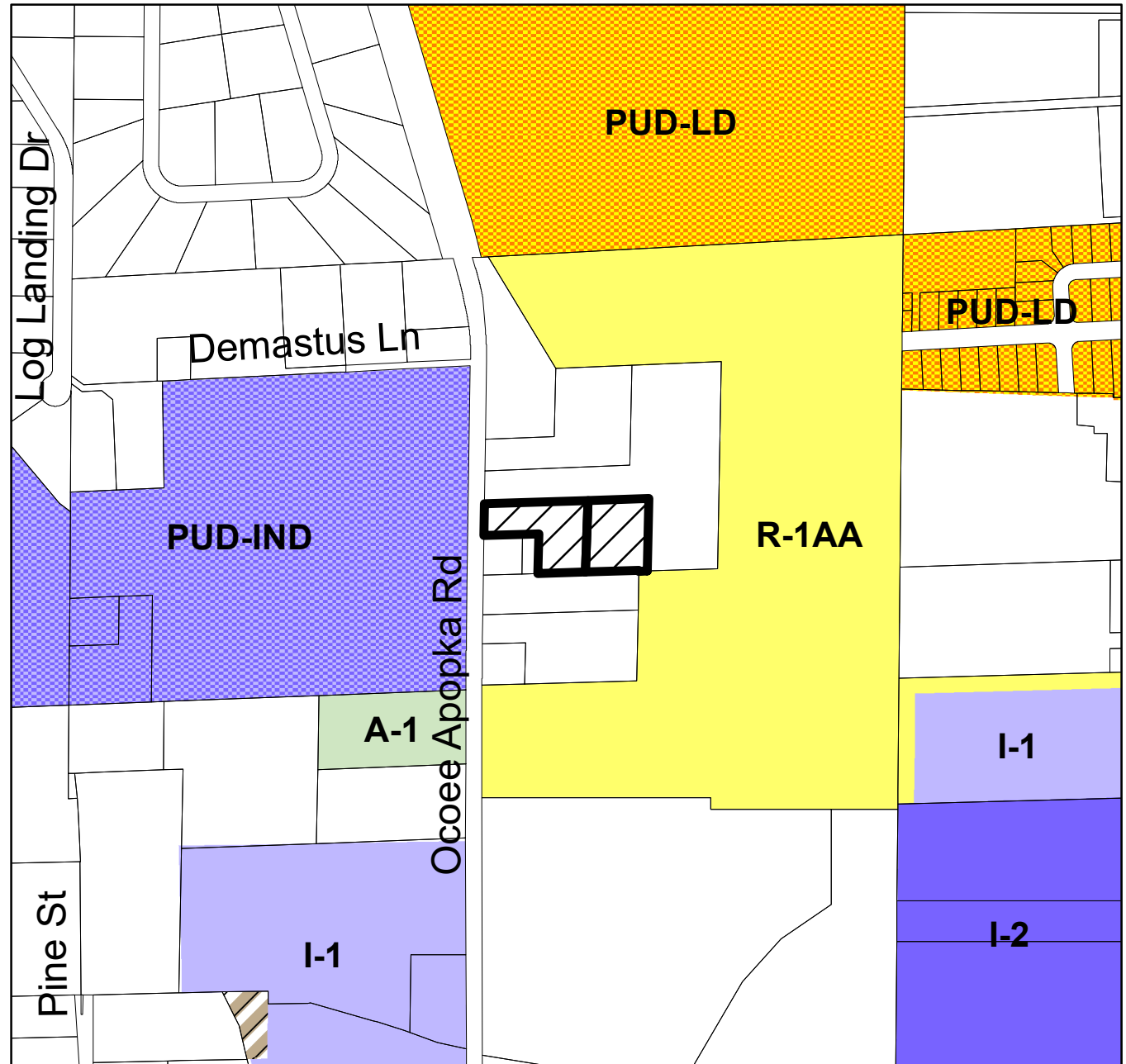
0 120 240 480
Feet

Created: month year

 Subject Property

Zoning Classification:

-  General Agricultural (A-1)
-  Suburban (A-2)
-  Single-Family Dwelling (R-1AAA)
-  Single-Family Dwelling (R-1AA)
-  Single-Family Dwelling (R-1A)
-  Single-Family Dwelling (R-1)
-  One- & Two-Family Dwelling (R-2)
-  Multiple-Family Dwelling (R-3)
-  Mobile Home Subdivision (RT-1)
-  Professional Offices & Services (P-S)
-  Neighborhood Shopping (C-1)
-  Community Commercial (C-2)
-  General Commercial (C-3)
-  Restricted Manufacturing & Warehousing (I-1)
-  General Industrial (I-2)
-  Commercial (PUD)
-  Low Density (PUD)
-  Medium Density (PUD)
-  High Density (PUD)
-  Public Use (PUD)
-  Unclassified



FROM THE CENTER OF SECTION 7, TOWNSHIP 22 SOUTH, RANGE 28 EAST, ORANGE COUNTY, FLORIDA, RUN SOUTH 01 DEGREES 08 MINUTES 30 SECONDS WEST ALONG THE NORTH-SOUTH MID-SECTION LINE 779.03 FEET; THENCE NORTH 88 DEGREES 09 MINUTES 36 SECONDS EAST 1.48 FEET TO THE POINT OF BEGINNING; THENCE NORTH 08 DEGREES 09 MINUTES 36 SECONDS WEST 100.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 01 DEGREES 08 MINUTES 30 SECONDS WEST 228.76 FEET; THENCE SOUTH 87 DEGREES 47 MINUTES 07 SECONDS WEST 27.00 FEET; THENCE NORTH 01 DEGREES 08 MINUTES 30 SECONDS EAST 3.91 FEET; THENCE SOUTH 88 DEGREES 09 MINUTES 36 SECONDS WEST 318.03 FEET TO THE POINT OF BEGINNING; THENCE NORTH 08 DEGREES 09 MINUTES 36 SECONDS WEST 100.00 FEET TO THE POINT OF BEGINNING; THENCE NORTH 01 DEGREES 08 MINUTES 30 SECONDS EAST 100.00 FEET TO THE POINT OF BEGINNING, LESS ROAD RIGHT OF WAY ON WEST.

BEARINGS SHOWN HEREON ARE BASED ON THE WEST LINE OF THE SOUTHEAST 1/4 OF SECTION 07-22 SOUTH, RANGE 28 EAST AS BEING SOUTH 01°04'14" WEST (AN ASSUMED BEARING FOR ANGULAR DESIGNATION ONLY)

THERE MAY BE EASEMENTS AND RESTRICTIONS OF RECORD AND/OR PRIVATE AGREEMENTS NOT FURNISHED TO THIS SURVEYOR OR SHOWN ON THIS BOUNDARY SURVEY THAT MAY AFFECT PROPERTY RIGHTS AND/OR LAND USE RIGHTS OF THE SUBJECT PROPERTY.

THERE MAY BE ENVIRONMENTAL ISSUES AND/OR OTHER MATTERS REGULATED BY VARIOUS DEPARTMENTS OF FEDERAL, STATE OR LOCAL GOVERNMENTS AFFECTING THE SUBJECT PROPERTY NOT SHOWN ON THIS SURVEY.

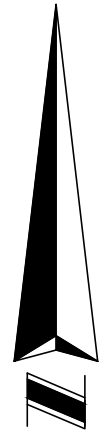
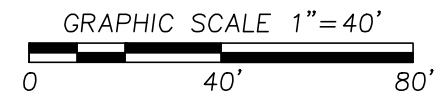
THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER OR AN ELECTRONIC SIGNATURE THAT IS IN COMPLIANCE WITH FLORIDA ADMINISTRATIVE CODE 5J-17.062.

UNLESS OTHERWISE NOTED OR SHOWN HEREON, THERE ARE NO APPARENT AND/OR UNOBSTRUCTED, ABOVE GROUND ENCROACHMENTS. THE DISPOSITION OF ANY POTENTIAL ENCROACHING IMPROVEMENTS SHOWN IS BEYOND THE PROFESSIONAL PURVIEW OF THE SURVEYOR AND SUBJECT TO LEGAL INTERPRETATION.

LAST DATE IN FIELD: AUGUST 15, 2023.



CONC	CONCRETE		OVERHEAD ELECTRIC
E/P	EDGE OF PAVEMENT		FENCE LINE AS NOTED
PG(S)	PAGE(S)		TOP OF BANK
LB	LICENSED BUSINESS		TOE OF SLOPE
R/W	RIGHT OF WAY		
PID	PARCEL IDENTIFICATION NUMBER		SINGLE STAND SIGN
CLF	CHAIN LINK FENCE		WOODEN POWER POLE
IRC	IRON ROD & CAP		TELECOMMUNICATION RISER
RCP	REINFORCED CONCRETE PIPE		FOUND IRON ROD OR PIPE AS NOTED
I.D.	IDENTIFICATION		SET 1/2" IRON ROD OR NAIL & DISK LB#6723
(D)	DEED		WELL
(M)	MEASURED		
(C)	CALCULATED		ASPHALT



16 EAST PLANT STREET
WINTER GARDEN, FLORIDA 34787
(407) 654-5355 LB#6723

AECOM

JAMES L. RICKMAN, P.S.M. #5633

JOB #: 20230899
DATE: 03/08/2024
SCALE: 1" = 40'
CALC BY: DY
FIELD BY: TS
DRAWN BY: MCD
CHECKED BY: DY

SHEET 1 OF 1

**ORDINANCE NO. 2024-
(Annexation Ordinance for
MDTL Enterprise LLC Property)**

**TAX PARCEL ID: 07-22-28-0000-00-074 &
07-22-28-0000-00-105**

**CASE NO. AX-03-24-04: MDTL Enterprise LLC
Annexation**

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 2.17 ACRES LOCATED ON THE EAST SIDE OF OCOEE APOPKA ROAD APPROXIMATELY 3,392 FEET SOUTH OF FULLERS CROSS ROAD AT ITS INTERSECTION WITH OCOEE APOPKA ROAD AND ASSIGNED PARCEL ID NUMBERS 07-22-28-0000-00-074 AND 07-22-28-0000-00-105, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, pursuant to Section 171.044, Florida Statutes, the owner of certain real properties located in unincorporated Orange County, Florida, as hereinafter described, has petitioned the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to annex approximately 2.17 acres of property, as more particularly described in **Exhibit “A”** attached hereto, into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, the Ocoee City Commission has determined that said petition bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida; and

WHEREAS, notice of the proposed annexation has been published pursuant to the requirements of Section 171.044(2), Florida Statutes, and Section 5-9(E), Article V, Land Development Code of the City of Ocoee (the “Code”); and

WHEREAS, on April 9, 2024, the Planning and Zoning Commission of the City of Ocoee, Florida, reviewed the proposed annexation and found it to be consistent with the Ocoee Comprehensive Plan, to comply with all applicable requirements of the Ocoee City Code, and to be in the best interest of the City of Ocoee and has recommended to the Ocoee City Commission that it approve said annexation petition; and

WHEREAS, the Ocoee City Commission has the authority, pursuant to Section 171.044, Florida Statutes, to annex said real property into its corporate limits upon petition of the owners of said real property; and

WHEREAS, the Ocoee City Commission is desirous of annexing and redefining the boundary lines of the City of Ocoee, Florida, to include said real property.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

Section 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida, Chapters 166 and 171, Florida Statutes, and Section C-7 of Article 1 of the Charter of the City of Ocoee, Florida.

Section 2. PETITION. The Ocoee City Commission hereby finds that the petition to annex certain lands, as hereinafter described, into the corporate limits of the City of Ocoee, Florida, bears the signatures of all owners of the real property proposed to be annexed into the corporate limits of the City of Ocoee, Florida.

Section 3. ANNEXATION. The following described real property located in unincorporated Orange County, Florida, is hereby annexed into the corporate limits of the City of Ocoee, Florida:

**SEE EXHIBIT “A” ATTACHED HERETO AND BY THIS
REFERENCE MADE A PART HEREOF**

Section 4. MAP. A map of said land herein described, which clearly shows the annexed area, is attached hereto as **EXHIBIT “B”** and by this reference is made a part hereof.

Section 5. CONSISTENCY FINDING. The Ocoee City Commission hereby finds that the annexation of said land herein described is consistent with the Ocoee Comprehensive Plan, as amended, and meets all of the requirements for annexation set forth in Florida Statutes § 171.044, the Ocoee Comprehensive Plan and the Ocoee City Code.

Section 6. CORPORATE LIMITS. The corporate territorial limits of the City of Ocoee, Florida, are hereby redefined to include said land herein described and annexed.

Section 7. OFFICIAL MAPS. The City Clerk is hereby authorized to update and supplement official City maps of the City of Ocoee, Florida, to include said land herein described and annexed.

Section 8. LIABILITY. The land herein described and future inhabitants of said land herein described shall be liable for all debts and obligations and be subject to all species of taxation, laws, ordinances, and regulations of the City of Ocoee, Florida, and be entitled to the same privileges and benefits as other areas of the City of Ocoee, Florida.

Section 9. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of

competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

Section 10. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

Section 11. EFFECTIVE DATE. This Ordinance shall become effective upon passage and adoption. Thereafter, the City Clerk is hereby directed to file a certified copy of this Ordinance with the Clerk of the Circuit Court for Orange County, Florida, the Chief Administrative Officer of Orange County, Florida, and with the Florida Department of State within seven (7) days from the effective date.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

By: _____
City Attorney

EXHIBIT "A"

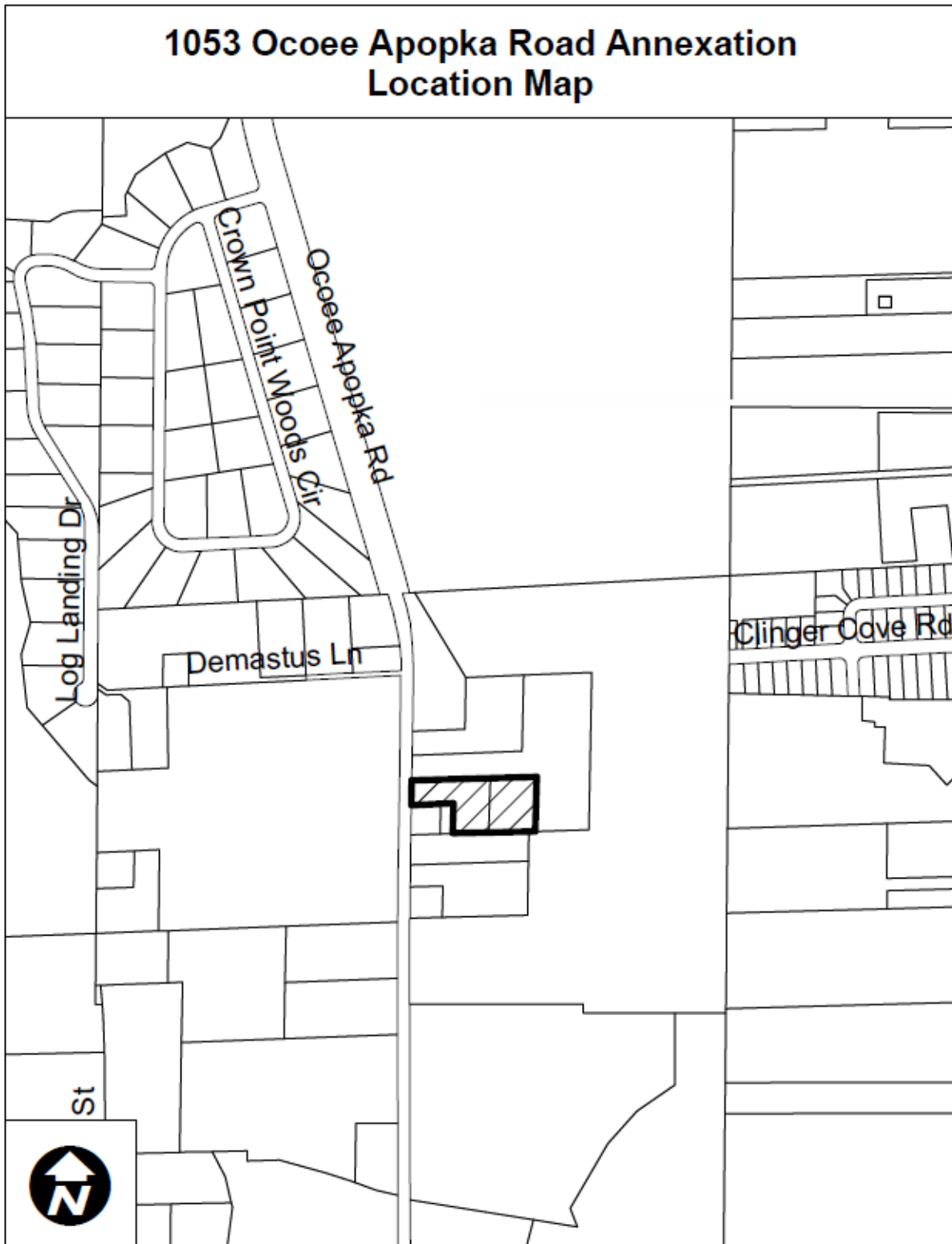
LEGAL DESCRIPTIONS

PARCEL ID NO.: 07-22-28-0000-00-074 AND 105 (Same legal description on OCPA & submitted survey)

FROM THE CENTER OF SEC RUN S 01 DEG W 779.03 FT TH N 88 DEG E 1.48 FT FOR POB TH N 88 DEG E 519.27 FT S 01 DEG W 228.76 FT S 87 DEG W 27 FT N 01 DEG W 3.91 FT S 88 DEG W 318.03 FT N 01 DEG E 125 FT S 88 DEG W 173.77 FT N 01 DEG E 100 FT TO POB IN SEC 07-22-28 (LESS RD R/W ON W)

EXHIBIT "B"

LOCATION MAP



West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

**CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
MDTL ENTERPRISE PROPERTY
ANNEXATION
CASE NUMBER: AX-03-24-04**

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-10, of the City of Ocoee Land Development Code, that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider the Annexation for the MDTL Enterprise Property Annexation. The subject property consists of two (2) parcels assigned Parcel ID #s 07-22-28-0000-00-074 & 07-22-28-0000-00-105 and a combined total of approximately 2.17 acres. The properties are located on the east side of Ocoee Apopka Rd., approximately 3,392 feet south of Fullers Cross Rd. at the intersection of Ocoee Apopka Rd.

ORDINANCE NO. 2024-12

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, ANNEXING INTO THE CORPORATE LIMITS OF THE CITY OF OCOEE, FLORIDA, CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 2.17 ACRES LOCATED ON THE EAST SIDE OF OCOEE APOPKA ROAD APPROXIMATELY 3,392 FEET SOUTH OF FULLERS CROSS ROAD AT ITS INTERSECTION WITH OCOEE APOPKA ROAD AND ASSIGNED PARCEL ID NUMBERS 07-22-28-0000-00-074 AND 07-22-28-0000-00-105, PURSUANT TO THE APPLICATION SUBMITTED BY THE PROPERTY OWNER; FINDING SAID ANNEXATION TO BE CONSISTENT WITH THE FLORIDA STATUTES, THE OCOEE COMPREHENSIVE PLAN, THE OCOEE CITY CODE AND THE JOINT PLANNING AREA AGREEMENT; PROVIDING FOR AND AUTHORIZING THE UPDATE OF OFFICIAL CITY MAPS; PROVIDING DIRECTION TO THE CITY CLERK; PROVIDING FOR SEVERABILITY; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; AND PROVIDING FOR AN EFFECTIVE DATE.

If the applicant's request for annexation is approved, the annexation will incorporate the property into the City of Ocoee. Pursuant to Subsection 5-9 B. of the Land Development Code, the Planning Director has determined that the requested annexation is within the Ocoee-Orange County Joint Planning Area (JPA) and is consistent with the Ocoee-Orange County JPA Land Use Map and the Ocoee Comprehensive Plan.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105.

Melanie Sibbitt, City Clerk
May 9, 16, 2024

24-01544W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.

STAFF REPORT

Meeting Date: May 21, 2024
Item #: 16

Contact Name: Anoch Whitfield
Contact Number: Ext. 1016

Department Director: Michael Rumer
City Manager: Robert Frank

Subject: Second Reading of Ordinance for Gardenia Pointe Rezoning from Unclassified District and R-1A (Single-Family Dwelling) to PUD (Planned Unit Development District); Project No.RZ-23-02-02. (Zoning Manager Whitfield)

Background Summary: First Reading of Ordinance held on March 5, 2024. This Second Reading is a continuance from the April 16, 2024, City Commission Meeting.

Owner/Applicant: The property is owned by the International Church of the Foursquare Gospel, and the applicant is Geoff Summitt, G L Summitt Engineering, Inc.

Site Location: The property is located in Commission District 4 on the north side of the FCEN Railroad tracks at the terminus of the unimproved Ocoee Vista Parkway right-of-way.

Property Size & Parcel Identification Number: The property consists of four (4) parcels, totaling approximately 37.37 acres, and is assigned parcel ID numbers 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128, and 03-22-28-2834-01-201.

Existing Site Conditions: The table below summarizes the existing site characteristics of the property.

Current Future Land Use Map (FLUM) Designation	Current Zoning District	Existing Land Use	Unique Features/Overlay Districts
Low Density Residential & Conservation	Unclassified & R-1A	Vacant	Karst Features, Type A Soils and Wetlands along the northern half of the property

The table below lists the jurisdictions, future land use designations, zoning districts, and existing uses of the surrounding properties.

Direction	Jurisdiction	Future Land Use Designation	Zoning	Existing Land Uses
North	City of Ocoee	Low Density Residential & Conservation	R-1A	Single-family residential in a portion of the northeast and Prairie Lake along the remainder of the north boundary
South	City of Ocoee/County	Low Density Residential & Conservation	City Unclassified & County A-1	Church use & a single-family dwelling
East	City	Low Density Residential	Ocoee R-1A & County A-1	Single-family detached subdivision
West	City	Low Density Residential & Conservation	PUD-MD	Single-family attached (townhome) subdivision

Proposed Development: The applicant is requesting a rezoning from Unclassified District and R-1A (single-family Dwelling) to PUD (Planned Unit Development District). Per the proposed Land Use Plan (LUP), the applicant proposes to develop an 84-lot single-family attached (fee simple townhome) residential subdivision at a proposed density of 3.43 units per acre. The proposed development standards are provided in the LUP, specifically on Sheet 5 Overall Site Plan, including standards for parking, building setbacks, impervious surface area, living area, open space, lot coverage, and parks and recreation. Although four (4) parcels are included in the proposed rezoning, per the proposed LUP, the development of the townhome subdivision will be only on the upland area of parcel number 10-22-28-0000-00-003. This development will not encroach into the wetland areas.

Consistency with Adopted Comprehensive Plan: The proposed PUD zoning classification and accompanying Land Use Plan for the development of single-family attached residential uses is consistent with the current Low Density Residential and Conservation future land use designations. The property is located within the Wekiva Study Area and contains karst features, Type A soils, and areas with three coincident protected features. As such, the property is subject to the requirement to set aside thirty-five percent (35%) open space, or approximately 13.08 acres. The proposed Land Use Plan proposes to preserve 12.87 acres of wetland area and create 8.25 acres of open space tracts for a total open space area of 56.5% (or approximately 21.12 acres). In addition, approximately 2.03 acres will be wet retention areas.

Transportation and Access: Because of the railroad tracks and the wetlands along the north, the site can only be accessed by Ocoee Vista Parkway. Ocoee Vista Parkway currently ends at the Prairie Lake Reserve and Prairie Meadows subdivisions entrances. The City's Ocoee Vista Parkway unimproved right-of-way (ROW) extends to this property's eastern boundary. Development of this proposed subdivision will include the construction (to City standards) of Ocoee Vista Parkway for the length of the unimproved ROW, where the road will then become a private roadway within a private ROW. There will be no vehicular or pedestrian connections or access to Prairie Oaks Court or Prairie Lake Boulevard.

Utilities: The Utilities Department has indicated that water and reclaim water are available for this property. Wastewater treatment capacity is available. However, the applicant must schedule a meeting with the Utilities Department to discuss the point of connection to the sanitary sewer. There is an existing drainage, utility, and sidewalk easement on the Prairie Meadows Subdivision Plat that connects the available manhole in Prairie Meadows to Ocoee Vista Parkway. Engineering for utilities will occur at the time of the final subdivision plan review.

Stormwater: Stormwater management is proposed to be provided on-site, and engineering of the stormwater facilities will be evaluated at the time of the preliminary subdivision plan review.

Schools: Orange County Public Schools (OCPS) has provided a Formal School Capacity Determination Letter indicating that OCPS has the available capacity to accommodate the anticipated student demand from this development. School concurrency will need to be satisfied prior to final subdivision plan approval.

Recreation and Open Space: Per the proposed Land Use Plan, a minimum of 1.3 acres of active and passive recreation area will be provided, such as playgrounds, athletic fields, other play courts, picnic benches, and trails. In addition to the tot lot, the internal sidewalks will be demarcated to show distances to encourage the use of the sidewalks for exercise purposes.

Issue:

Should the Honorable Mayor and City Commissioners approve the proposed ordinance for the Rezoning from Unclassified District and R-1A (single-family Dwelling) to PUD (Planned Unit Development District) for the Gardenia Pointe Subdivision to be located on four (4) parcels, assigned parcel ID numbers 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128, and 03-22-28-2834-01-201?

Recommendations:

Development Review Committee (DRC) Recommendation:

The DRC met on Tuesday, January 2, 2024, to consider this proposed rezoning and, finding no issues, made a recommendation of approval of proposed Rezoning from Unclassified District and R-1A to PUD (Planned Unit Development District) for the Gardenia Pointe Subdivision to be located on four (4) parcels, assigned parcel ID numbers 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128, and 03-22-28-2834-01-201.

Planning & Zoning Commission (PZC) Recommendation:

The Planning & Zoning Commission heard this item at its February 13, 2024, public hearing. Discussions and public comments were relative to increased traffic on Clarke Road and Ocoee Vista Parkway, school bus stop and safety, access onto A. D. Mims across the railroad tracks, speeding on Clarke Road, noise from the trains on the railroad, natural resources (wetlands and wildlife), medium density of the development, people cutting through Prairie Lake Reserve and Prairie Meadows, trees between the access road and the railroad, fencing between the proposed development and the railroad, improvements on Clarke Road, and maintenance of the conservation area.

Following public comments and discussion, the Planning and Zoning Commission made a recommendation of approval, by a 4 to 1 vote, of the proposed Rezoning from Unclassified District and R-1A to PUD (Planned Unit Development District) for the Gardenia Pointe Subdivision to be located on four (4) parcels, assigned parcel ID numbers 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128, and 03-22-28-2834-01-201.

Staff Recommendation:

Staff recommends the Honorable Mayor and City Commissioners approve the proposed ordinance for the Rezoning from Unclassified District and R-1A to PUD (Planned Unit Development District) for the Gardenia Pointe Subdivision to be located on four (4) parcels, assigned parcel ID numbers 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128, and 03-22-28-2834-01-201.

Attachments:

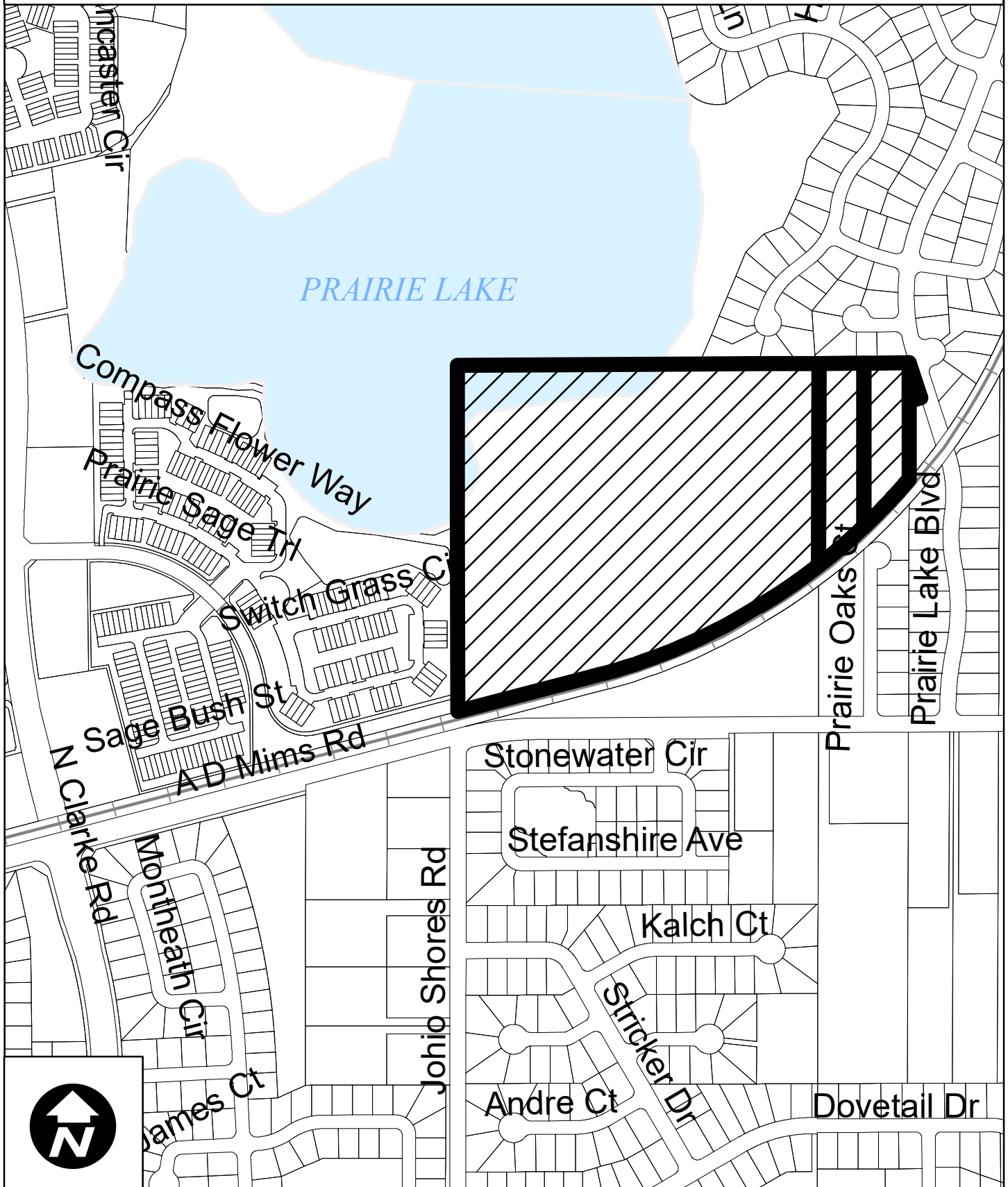
1. Location Map
2. Aerial Map
3. FLU Map
4. Surrounding Zoning Map
5. Gardenia Pointe LUP
6. Ordinance
7. Advertisement

Financial Impacts:

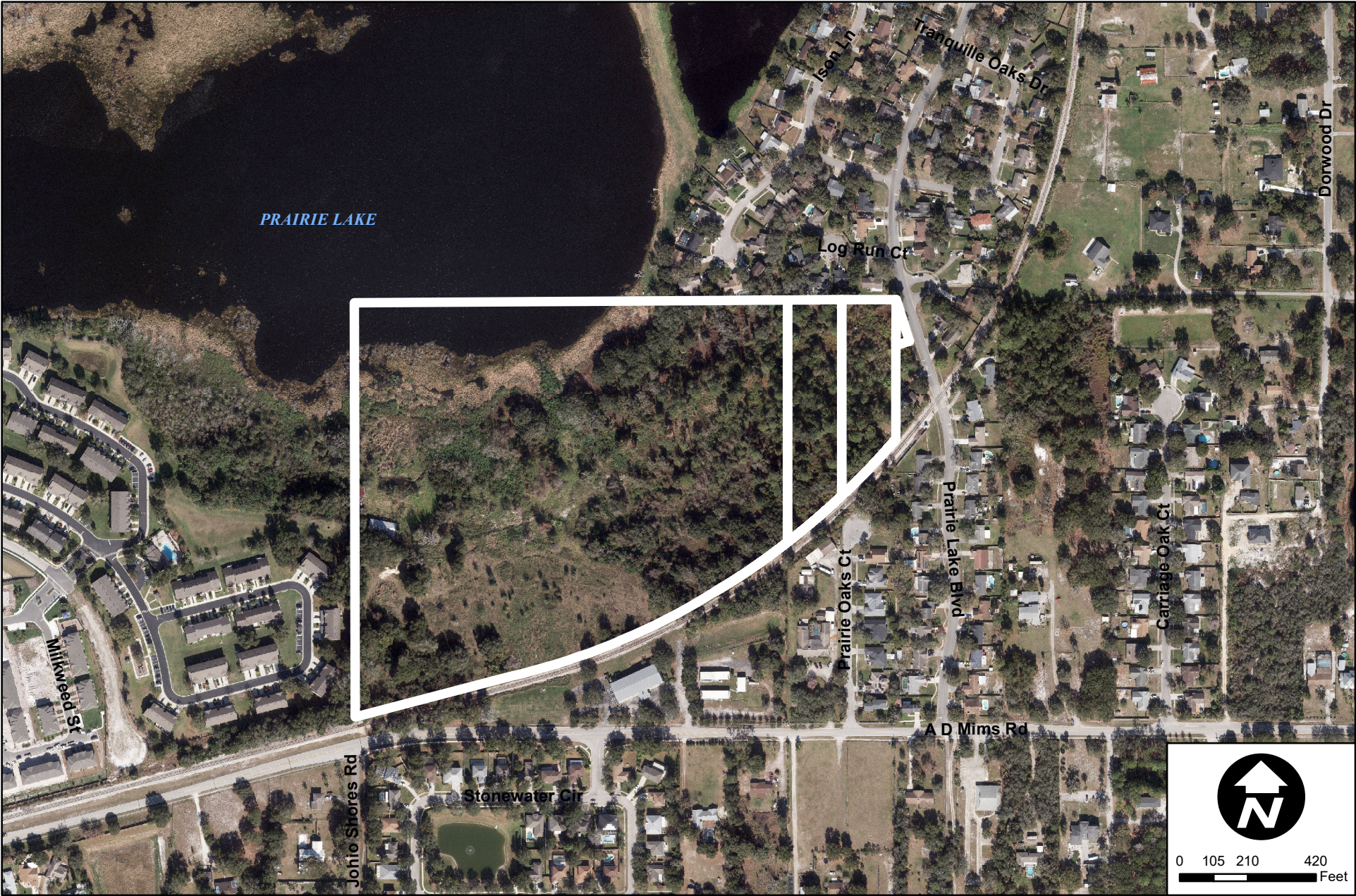
N/A

Type of Item: Second Reading Public Hearing

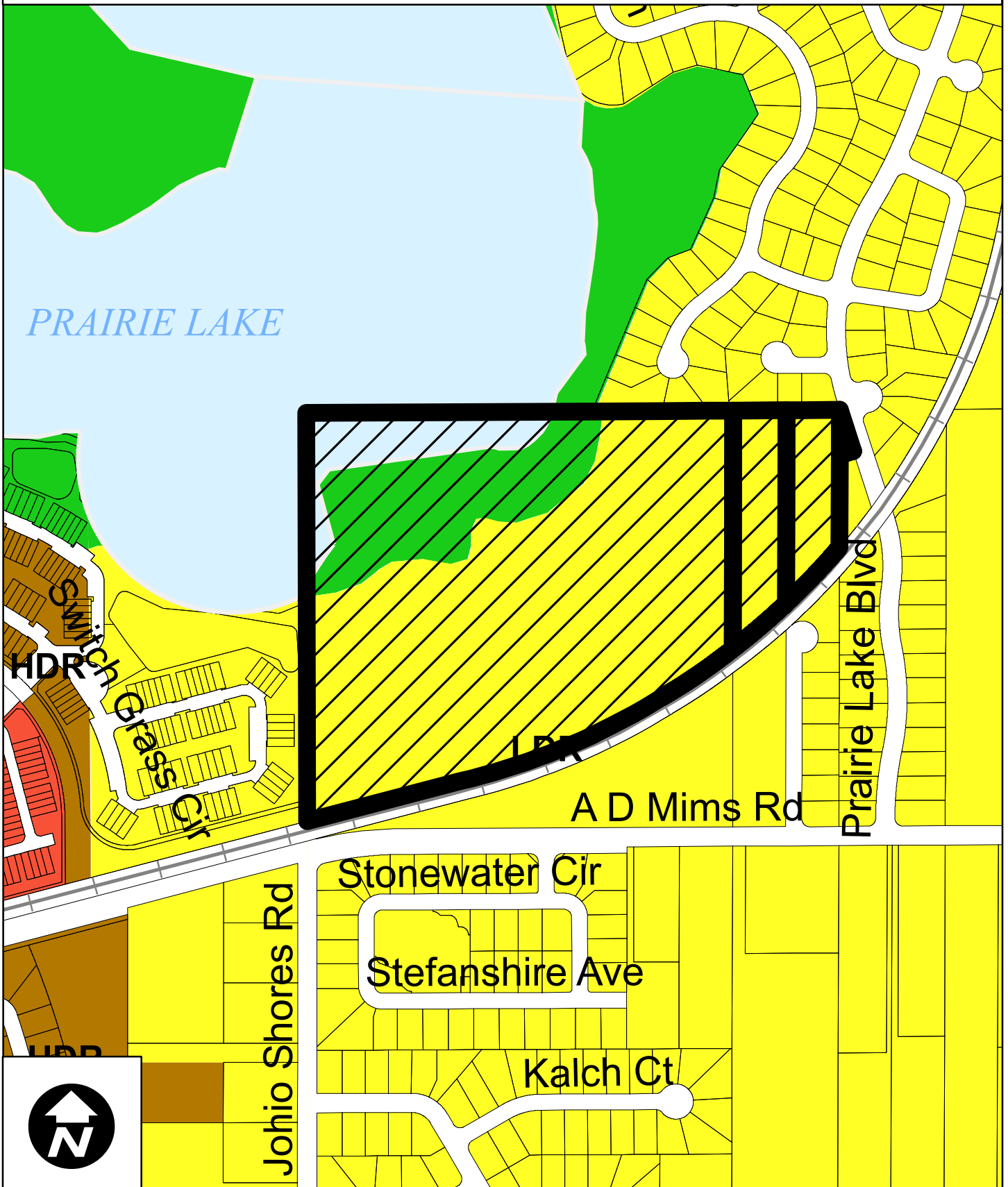
Gardenia Pointe Rezoning Location Map



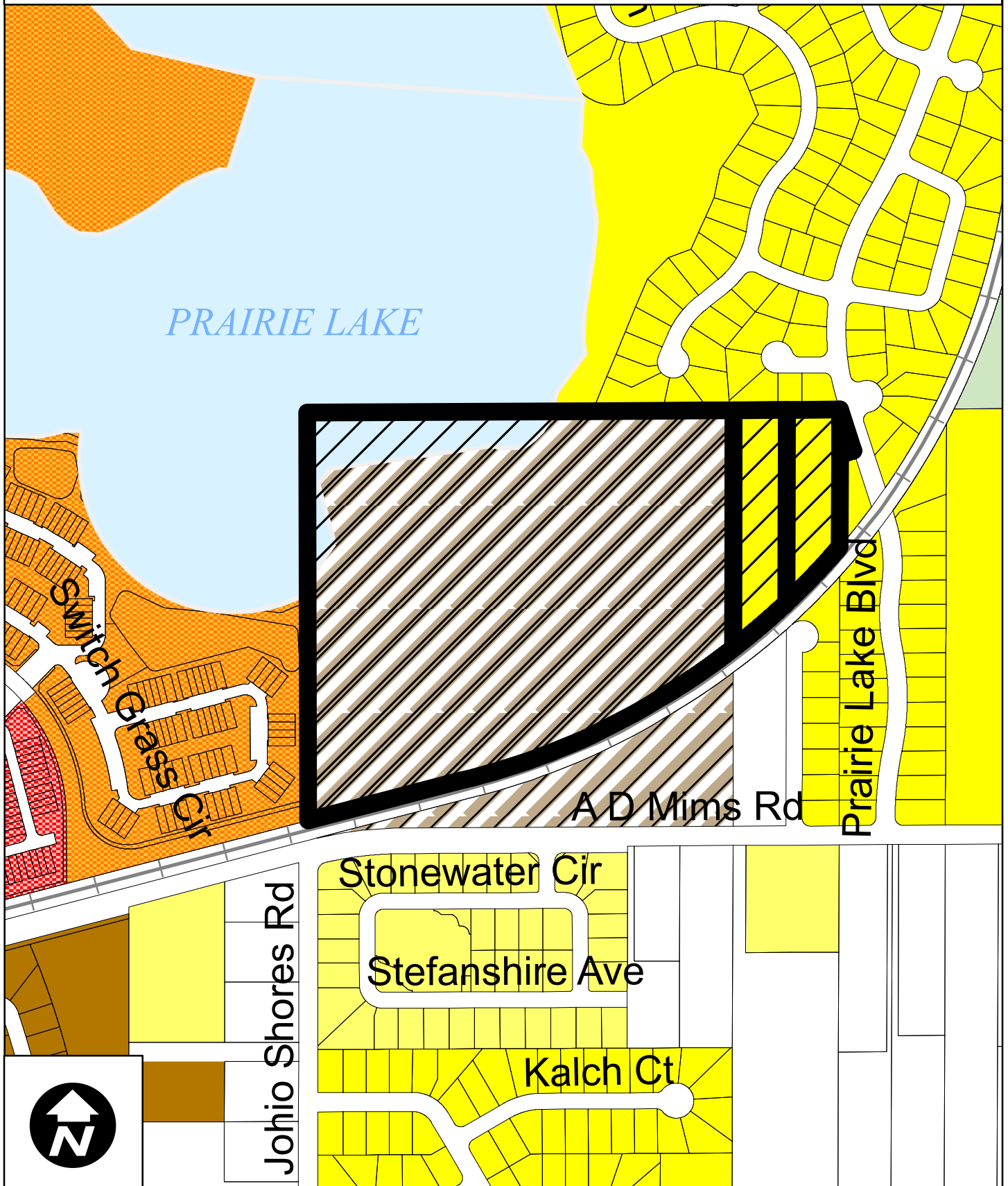
Gardenia Pointe Rezoning 2022 Aerial Map



Gardenia Pointe Rezoning Future Land Use Map



Gardenia Pointe Rezoning Surrounding Zoning Map



Page 1444 of 1460

PROPOSED SYMBOLS

LINES		STORM DRAIN	
	BOUNDARY		100 LINEAR FEET STORM PIPE 24" REINFORCED CONCRETE PIPE @ 0.20%
	CONSERVATION SETBACK		UNDERDRAIN 6" PVC PIPE
	CENTER LINE		DRAINAGE FLOW DIRECTION
	CHAIN LINK FENCE		FDOT INLET TYPE 1
	CONTOUR		FDOT INLET TYPE 2
	EASEMENT		FDOT INLET TYPE 3
	FENCE		FDOT INLET TYPE 4
	GUARDRAIL		FDOT INLET TYPE 5
	LOT LINE		FDOT INLET TYPE 6
	PROPERTY LINE		MANHOLE
	RETAINING WALL		MITERED END SECTION
	RIGHT-OF-WAY LINE		SLOPE DIRECTION ARROW FOR POND SIDE SLOPE
	SETBACK LINE		SPOT ELEVATION
	SHORELINE		STORM INLET
	SWALE		
	TREE LINE		
SANITARY		HIGHWAY & UTILITIES	
	100 LINEAR FEET SANITARY 8" PVC PIPE @ 0.40% SLOPE		BOUND CORNER
	CLEANOUT		CONCRETE
	DOUBLE SANITARY SERVICE		COUNTY ROADS
	FORCE MAIN		DETAIL REFERENCE
	MANHOLE		DUMPSTER PAD
			FINISHED FLOOR ELEVATION W/ FHA LOT TYPE
			GUY POLE
			HANDICAP PARKING
			INTERSTATE ROADS
			LIGHT POLE
			SIGNS
			SECTION CORNER
			STATE ROADS
			SILT FENCE
			TRAFFIC FLOW PAVEMENT MARKING
			UTILITY POLE
			BLDG OR STRUCTURE
			TYPE F CURB & GUTTER
			MIAMI CURB
			CROSS SECTION DETAIL
WATER & REUSE WATER			
	WM		
	11 1/2° BEND		
	22 1/2° BEND		
	45° BEND		
	90° BEND		
	TEE		
	CROSS		
	CHECK VALVE		
	DOUBLE DETECTOR CHECK VALVE		
	DOUBLE WATER SERVICE		
	GATE VALVE		
	FIRE HYDRANT		
	METER		
	REDUCER		
	BLOWOFF		
	BACKFLOW PREVENTER		
	SAMPLE POINT		
	UNDERDRAIN CEANOUT		
	RM		
	REUSE WATER SYSTEM CONNECTION		
	DOUBLE REUSE WATER SERVICE		



LEGAL DESCRIPTION

Description (per Doc # 20160351579 and ORB 7421, PG 615):

That portion of the West Half of the Southwest quarter of the Northwest Quarter of Section 10, Township 22 South, Range 28 East, Orange County, Florida, lying North of the A.C.L. Railroad right-of-way, and
That portion of the East Half of the Southwest Quarter of the Northwest Quarter of Section 10, Township 22 South, Range 28 East, Orange County, Florida, lying North of the A.C.L. Railroad right-of-way.

Parcel 1:
The East 1/2 of the West 1/4 of the Southeast 1/4 of the Northwest 1/4 of Section 10, Township 22 South, Range 28 East, Orange County, Florida, lying North of the SCL Railroad.

Parcel 2:
That part of lot 120, FOREST OAKS UNIT 1, according to the plat thereof, as recorded in Plat Book 12, Page 84, for the Public Records of Orange County, Florida, described as follows: BEGINNING at the North corner of said Lot 120 on the West right-of-way of Prairie Lake Boulevard (the "POINT OF BEGINNING"), thence run South 18° 07' 47" East along said West, at the right angles to the West line of said Lot 120; thence run North 00° 13' 06" East along the West line of said Lot 120, a distance of 142.33 feet to the POINT OF BEGINNING.

Parcel 3:
The West 1/8 of the Southeast 1/4 of the Northwest 1/4 of Section 10, Township 22 South, Range 28 East, Orange County, Florida, lying North of the SCL Railroad.

ABBREVIATIONS

(C) = CALCULATED
CONC = CONCRETE
CL = CENTERLINE
(M) = CONCRETE MONUMENT
(D) = DEED
FD = FOUND
ID = IDENTIFICATION
IR = IRON PIPE
IP = IRON PIPE
LB = LICENSED BUSINESS
(M) = MEASURED
ORB = OFFICIAL RECORD BOOK
PG = PAGE
ND = NAIL AND DISK
PRM = PERMANENT REFERENCE MONUMENT
FF = FINISHED FLOOR
ELEV = ELEVATION
APPROX = APPROXIMATE
RCP = REINFORCED CONCRETE PIPE
CPP = CORRUGATED PLASTIC PIPE
VCP = VITRIFIED CLAY PIPE
PVC = POLYVINYL CHLORIDE
POB = POINT OF BEGINNING
POC = POINT OF COMMENCEMENT
(P) = PLAT
PB = PLAT BOOK
PC = POINT OF CURVATURE
PCP = PERMANENT CONTROL POINT
PRC = POINT OF REVERSE CURVATURE
PT = POINT OF TANGENCY
R/W = RIGHT OF WAY
UE = UTILITY EASEMENT
AC = AIR CONDITIONER
PHR = PHONE RISER
EJB = ELECTRIC JUNCTION BOX
PP = POWER POLE
WM = WATER METER
CTVR = CABLE TV RISER
C = CLEAN OUT
WV = WATER VALVE
OHL = OVERHEAD LINE
LP = LIGHT POLE
BFP = BACK FLOW PREVENTER
EM = ELECTRIC METER
CA = COVERED AREA
TBM = TEMPORARY BENCHMARK
CCR = CERTIFIED CORNER OF RECORD
CATV = CABLE TELEVISION RISER

SYMBOLS

CONC MONUMENT
TYPE AS INDICATED
CONTROL POINT
TYPE AS INDICATED
BENCHMARK
TYPE AND ELEVATION
AS INDICATED
S SANITARY SEWER MANHOLE
D DRAINAGE MANHOLE
MH MANHOLE
OHL OVERHEAD LINE
ATT AT&T LINE
CTV CABLE TV LINE
ELC ELECTRIC LINE
FD FIBER OPTIC LINE
GAS GAS LINE
UTL UTILITY LINE
W WATER LINE
SS SEWER LINE
C CHAIN LINK FENCE
X WIRE FENCE
D WOOD FENCE
TR TRANSFORMER BOX
WATER METER
TRAFFIC SIGNAL BOX
ELECTRIC BOX
LIGHT POLE
UTILITY POLE
GUY WIRE
FIRE CONNECTION
CLEAN OUT
SIGN

SURVEYORS NOTES

THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE OPINION. THERE MAY EXIST MATTERS ON RECORD AFFECTING THE SUBJECT PROPERTY.

BEARINGS BASED ON THE SOUTH LINE OF THE NW 1/4 OF SECTION 10, T22S, R28E AS BEING N 89°41'16" W (AN ASSUMED DATUM PER GRID NORTH, FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NAD 1983, AS DERIVED FROM A PRIVATE NETWORK SOLUTION).

NO UNDERGROUND UTILITIES, FOUNDATIONS OR IMPROVEMENTS HAVE BEEN LOCATED, EXCEPT AS SHOWN HEREON.

ALL BEARINGS AND DISTANCES ARE PLAT AND MEASURED UNLESS NOTED OTHERWISE.

SYMBOLS ARE NOT TO SCALE.

THIS SURVEY DOES NOT DETERMINE OWNERSHIP OF FENCES.

FENCES ARE GRAPHICAL IN NATURE AND NOT TO SCALE. FENCE TIES ARE AS SHOWN HEREON.

ELEVATIONS SHOWN HEREON ARE BASED UPON AND MATCHED TO ORANGE COUNTY BENCHMARK DESIGNATION S-766021, HAVING A PUBLISHED ELEVATION OF 124.908, NORTH AMERICAN VERTICAL DATUM OF 1988, (NAVD 88).

SITE BENCHMARKS ARE AS SHOWN.

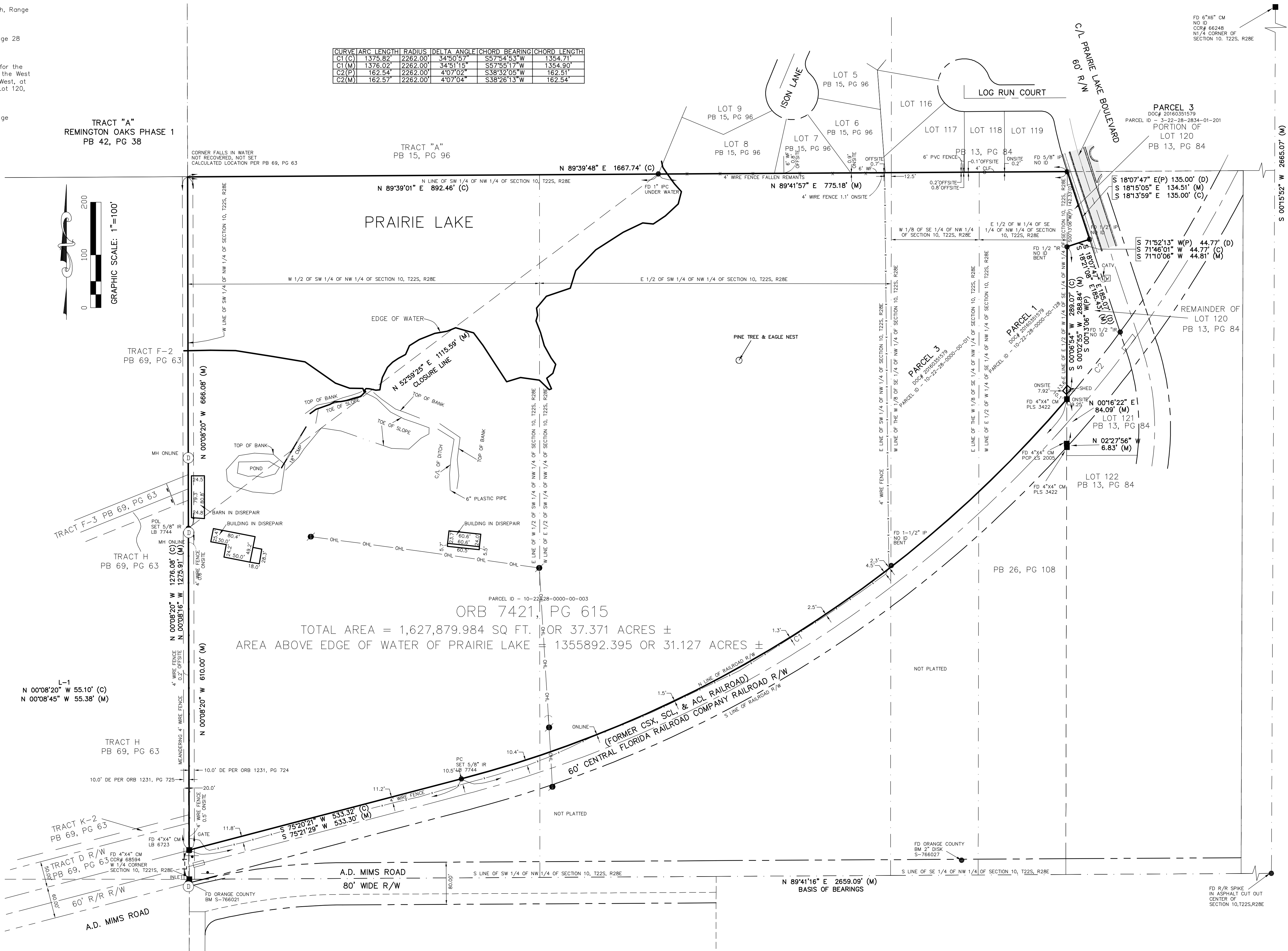
BASED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP PANEL NO. 12095C0210F HAVING A REVISION DATE OF SEPTEMBER 25, 2009, THE PROPERTY SHOWN HEREON LIES IN UNSHADED ZONE "X", AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AND FLOOD ZONE AE HAVING A BASE FLOOD ELEVATION OF 84.9

NO JURISDICTIONAL WETLANDS OR ENVIRONMENTAL AREAS HAVE BEEN LOCATED AS A PART OF THIS SURVEY. THERE MAY EXIST WETLANDS OR ENVIRONMENTAL AREAS AND THE SURVEYOR MAKES NO DETERMINATION OF SUCH.

THIS SURVEY DOES NOT DETERMINE THE "ORDINARY HIGH WATER LINE" OR THE "MEAN HIGH WATER LINE". THE STATE OF FLORIDA MAY OWN OR CLAIM THE OWNERSHIP OF THOSE LANDS LYING BELOW THE "ORDINARY HIGH WATERLINE" OR THE "MEAN HIGH WATER LINE" OR WITHIN ANY WETLAND LIMITS.

THE SCALE FOR THE MAP/DRAWING SHOWN HEREON IS 1"=100' AND IS INTENDED TO BE DISPLAYED ON A 24"x36" SIZED SHEET. ANY OTHER SHEET SIZE WILL ALTER THE SCALE OF THE DRAWING. COPIES AND REPRODUCTIONS MADE FROM PRINTS WILL/MAY ALTER THE SCALE OF THE DRAWING AS WELL.

BOUNDARY SURVEY



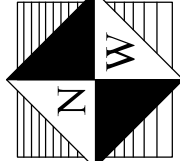
Surveyors Certification:

I hereby certify that this survey shown hereon was made in accordance with the "Standards of Practice" for land surveying in the State of Florida Chapter 5J-17-.050 to 0.052 Florida Administrative Code, pursuant to Chapters 177 and 472, Florida Statutes and unless it bears the signature and the original raised seal of a Florida Licensed Surveyor and Mapper, this drawing, sketch, plot or map is for informational purposes only and is not valid.

Ralph A. Nieto PSM No. 6025

Print Date

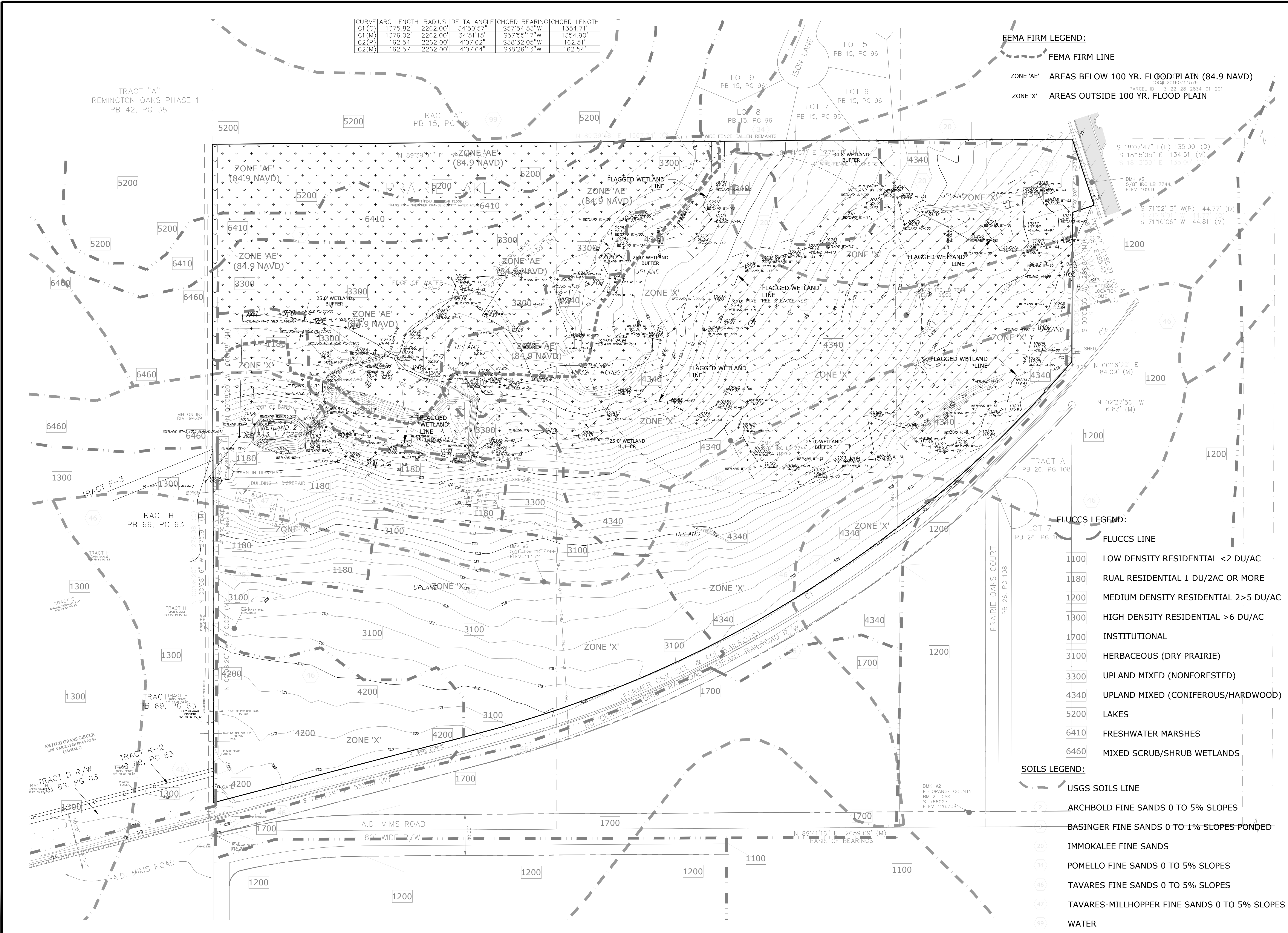
Nieto-Whittaker Surveying LLC
1728 N. Ronald Reagan Blvd., Longwood, FL 32750
PH: (407) 636-8460 FAX: (407) 636-8461
LB No. 7744



DATE: X/X/X
ORDER NO.: NW21-114
DRAWN BY: BPS
SHEET: 1 OF 1
SCALE: 1"=100'

FIELD BY: DW/SS	NO.	DATE

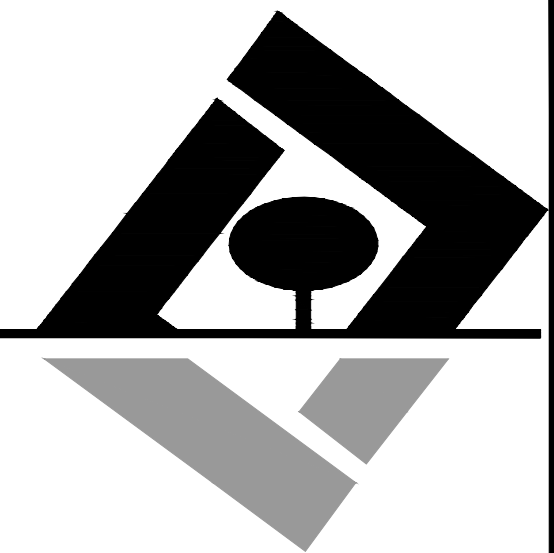
PREPARED FOR:
INTERNATIONAL CHURCH OF THE
FOURSQUARE GOSPEL
2200 A D MIMS ROAD, OCOEE, FL 34761



- FEMA FIRM LEGEND:**
- ZONE 'AE' AREAS BELOW 100 YR. FLOOD PLAIN (84.9 NAVD)
 - ZONE 'X' AREAS OUTSIDE 100 YR. FLOOD PLAIN

- FLUCCS LEGEND:**
- 1100 LOW DENSITY RESIDENTIAL <2 DU/AC
 - 1180 RUAL RESIDENTIAL 1 DU/2AC OR MORE
 - 1200 MEDIUM DENSITY RESIDENTIAL 2>5 DU/AC
 - 1300 HIGH DENSITY RESIDENTIAL >6 DU/AC
 - 1700 INSTITUTIONAL
 - 3100 HERBACEOUS (DRY PRAIRIE)
 - 3300 UPLAND MIXED (NONFORESTED)
 - 4340 UPLAND MIXED (CONIFEROUS/HARDWOOD)
 - 5200 LAKES
 - 6410 FRESHWATER MARSHES
 - 6460 MIXED SCRUB/SHRUB WETLANDS

- SOILS LEGEND:**
- USGS SOILS LINE
 - ARCHBOLD FINE SANDS 0 TO 5% SLOPES
 - BASINGER FINE SANDS 0 TO 1% SLOPES PONDED
 - IMMOKALEE FINE SANDS
 - POMELLO FINE SANDS 0 TO 5% SLOPES
 - TAVARES FINE SANDS 0 TO 5% SLOPES
 - TAVARES-MILLHOPPER FINE SANDS 0 TO 5% SLOPES
 - WATER



G L SUMMITT
ENGINEERING INC.
Office: Lake Mary
3667 Simonton Place
Lake Mary, Florida 32746
phone: 407-323-0705
fax: 407-992-8650
www.GLSeng.com

PMDW Ventures, LLC
6 Ambrose Lane
South Barrington, IL 60010

Gardenia Pointe Townhomes
City of Ocoee, Florida
Planned Development
Master Plan

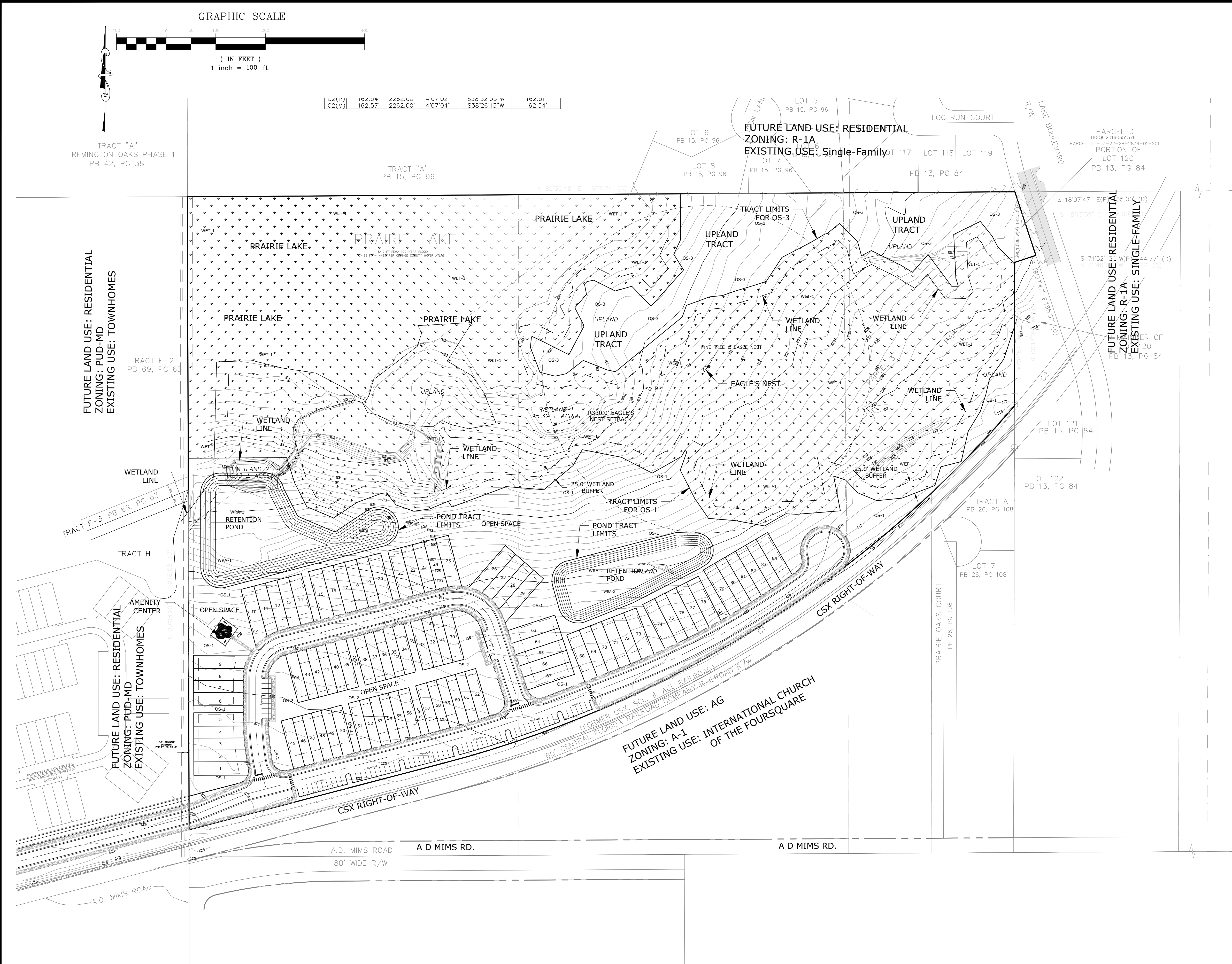
Existing Conditions

Plans not valid unless Signed,
Dated and Sealed below.

GEOFFREY L. SUMMITT, P.E.
Date: November 20, 2023
FL Registration #58775
Certificate of Authorization #29665

Revisions		
NO.	DATE	DESCRIPTION
1	01/05/23	Initial Release
2	08/31/23	Response To Comments
3	11/20/23	Response To Comments
4		
5		
6		
7		
8		
9		
10		

SHEET NUMBER
4 OF 11



SITE DATA:

Parcel I.D. #: 09-22-26-1100-0580-0001; 0000

Property FLU: Low Density Residential
Property Zoning: A (existing), PD (proposed)

Gross Land Area: 37.37 acres
Wetland Area: 12.87 acres
Prairie Lake: 6.51 acres
Gross Developable Area: 24.50 acres
Net Developable Area: 24.50 acres

Stormwater Management Area: 2.03 acres
Right-of-Way Area: 3.18 acres
Offsite Right-of-Way Dedication: 0.00 acres
Public Open Space Tracts: 8.25 acres

Proposed Residential Units: 84 Single-Family Attached Lots
Net Residential Density: 3.43 dwelling units/Net Developable Acre

Minimum Living Area: 1,400 sqft. (Heated/cooled space)
Maximum Building Height: Two Stories, 35'
Minimum Lot Width: 20' (Internal Block); 24' (External Block)
Minimum Lot Depth: N/A
Minimum Lot Size: 2,000 (Attached)
Maximum Lot Coverage: 80%
Minimum Open Space %: 25%

Setbacks:

20' Internal Block Lots:
Front: 25'
Side: 0.0' (Interior); 3.0' (End-Unit)
Rear: 17'
Rear Porch: 7.5'

24' External Block Lots:
Front: 20'
Side: 0.0' (Interior); 3.0' (End-Unit)
Rear: 17'
Rear Porch: 7.5'

Open Space Requirements:

Open Space Required: 24.50ac. * .25 = 6.13 acres (required)
Open Space Provided:
Tract OS-1: 4.54 acres
Tract OS-2: .78 acres
Tract OS-3: 2.93 acres
Tract WRA-1: 1.25 acres
Tract WRA-2: 0.78 acres
Total: 10.28 acres (6.13 required)

Major Street Setbacks:

CSX Railway: 25' (setback from right-of-way line)

Additional Notes:

- Billboards and pole signs shall be prohibited.
- There is no proposed 100 yr. Flood Plain encroachment and the property is in Zone 'X' & 'AE' areas inside/outside of the 100 yr. flood plain.
- A Homeowner's Association will be created for maintenance and ownership of common area tracts as reflected in the tract table.
- Fire Protection will be provided by City of Ocoee in accordance with the 2018 Florida Fire Prevention Code.
- The project will be constructed in a single phase.
- All units will be sprinkled for fire protection purposes.
- A Minimum of 1.3 acres of active and passive recreation (i.e. playgrounds, athletic fields, other play courts, picnic benches, trails, etc.).
- In addition to the tot lots the internal sidewalks will be demarcated to show distance to encourage use for exercise.

Off-Street Parking:

Required Parking: 2.0 spaces per Unit (for Single-Family Detached): 84 units x 2.0 spaces/unit = 168

Total Required Parking: 168
Provided Parking:
Guest Parking: 70 spaces
Units with 1-Space Garage: 33 spaces
Units with 2-Space Garage: 51 spaces
Driveway Parking Space: 84 spaces
Total Parking Provided: 289 spaces

Phasing:

This project is to be developed in one phases.

Traffic:

Single-Family Residential: 84 d.u. * 9.57 trip/d.u. = 804 A.D.T.

Stormwater Management:

The project will meet the requirements of City of Ocoee Land Development Code and the St. Johns River Water Management District.

School Age Population:

84 d.u. * .350 children/unit = 29 children

Needed Fire Flow (NFF): (Based on FFPC 2018 7th Edition Chapter 18 & Annex I)

Single-Family (less than 5,000 sqft.): 1,000 gpm
Single-Family (more than 5,000 sqft.): Per Table 18.4.5.2.1

Water, Sewer and Solid Waste Demand:

Water Demand:
84 Units * 350 gallons/day = 29,400 gallons/day

Sewer Demand:
84 Units * 300 gallons/day = 25,200 gallons/day

Solid Waste Demand:
84 Units * 2.6 persons/unit * 4.3 Lb./person/day = 939 Lb./day

TRACT TABLE				
TRACT LABEL	TRACT TYPE	Area (Ac.)	TRACT DEDICATED TO	EASEMENT DEDICATED TO
RW-1	Rights-of-Way	3.17	HOA	
OS-1	Open Space Area	4.84	HOA	
OS-2	Open Space Area	0.78	HOA	
OS-3	Open Space Area	2.93	HOA	
WET-1	Wetland/Water/Buffer	19.38	HOA	City of Ocoee/SJRWMD
WRA-1	Dry Retention Pond	1.25	HOA	City of Ocoee
WRA-2	Dry Retention Pond	0.78	HOA	City of Ocoee

G L SUMMITT
ENGINEERING INC.

Office: Lake Mary
3667 Simonton Place
Lake Mary, Florida 32746
phone: 407-323-0705
fax: 407-992-8650
www.GLSeng.com

PMDW Ventures, LLC
6 Ambrose Lane
South Barrington, IL 60010

Gardenia Pointe
Townhomes
City of Ocoee, Florida
Planned Development
Master Plan

Overall Site
Plan

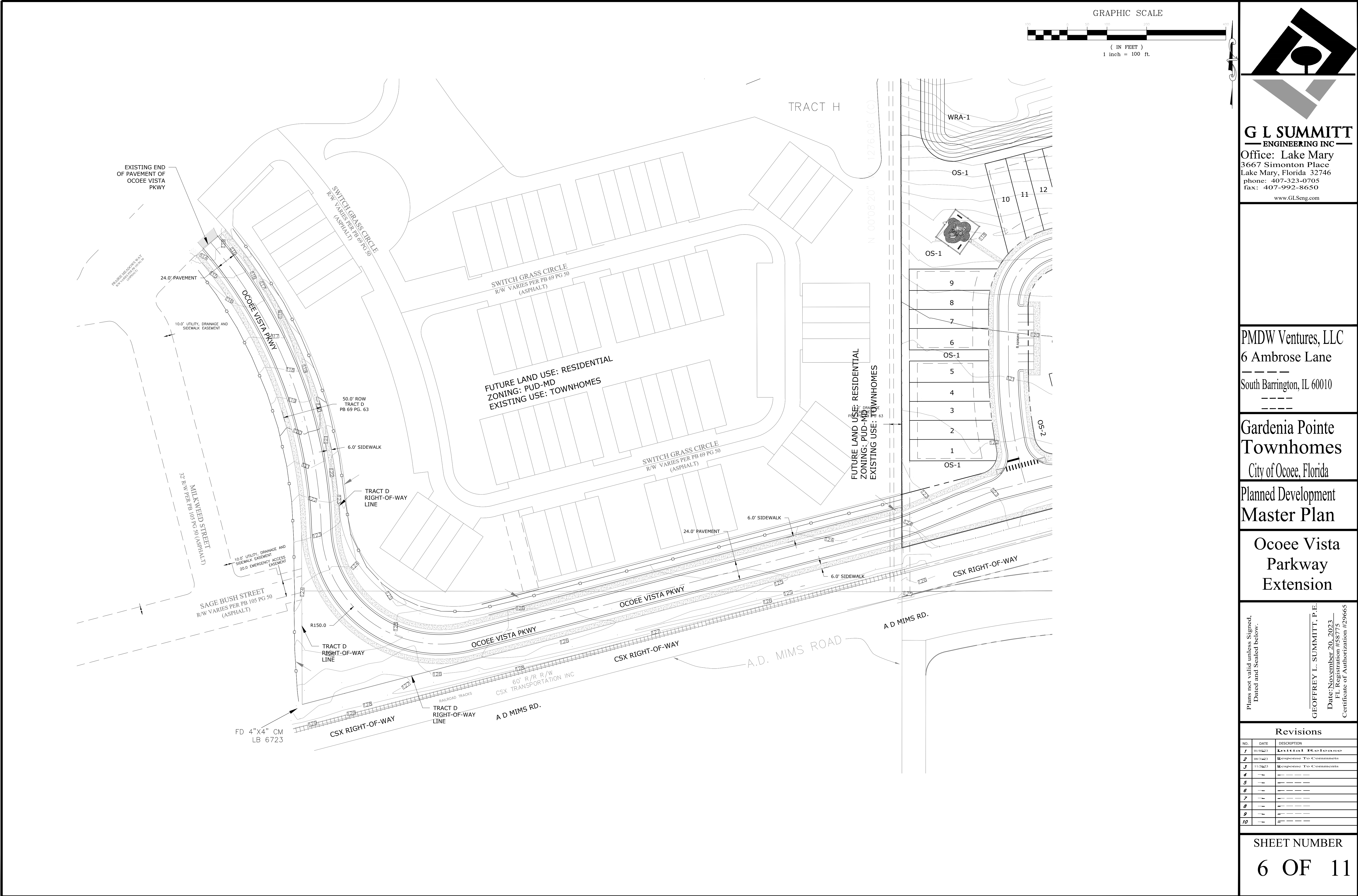
Plans not valid unless Signed,
Dated and Sealed below.

GEOFFREY L. SUMMITT, P.E.
Date: November 20, 2023
FL Registration #58775
Certificate of Authorization #29665

NO.	DATE	DESCRIPTION
1	01/04/23	Initial Release
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8	-	-
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10	-	-

SHEET NUMBER

5 OF 11



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Ocoee Vista
Parkway
Extension

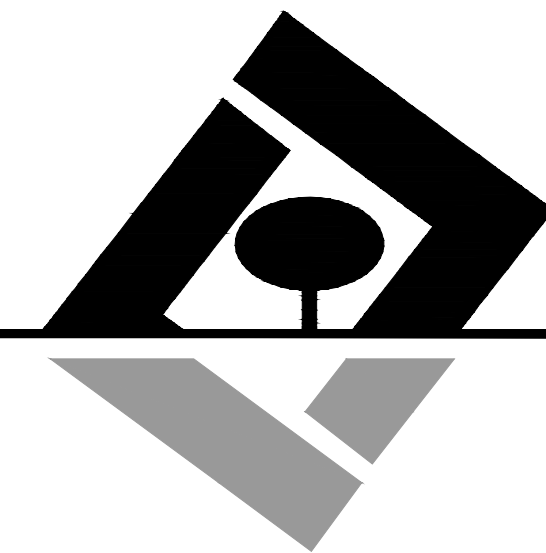
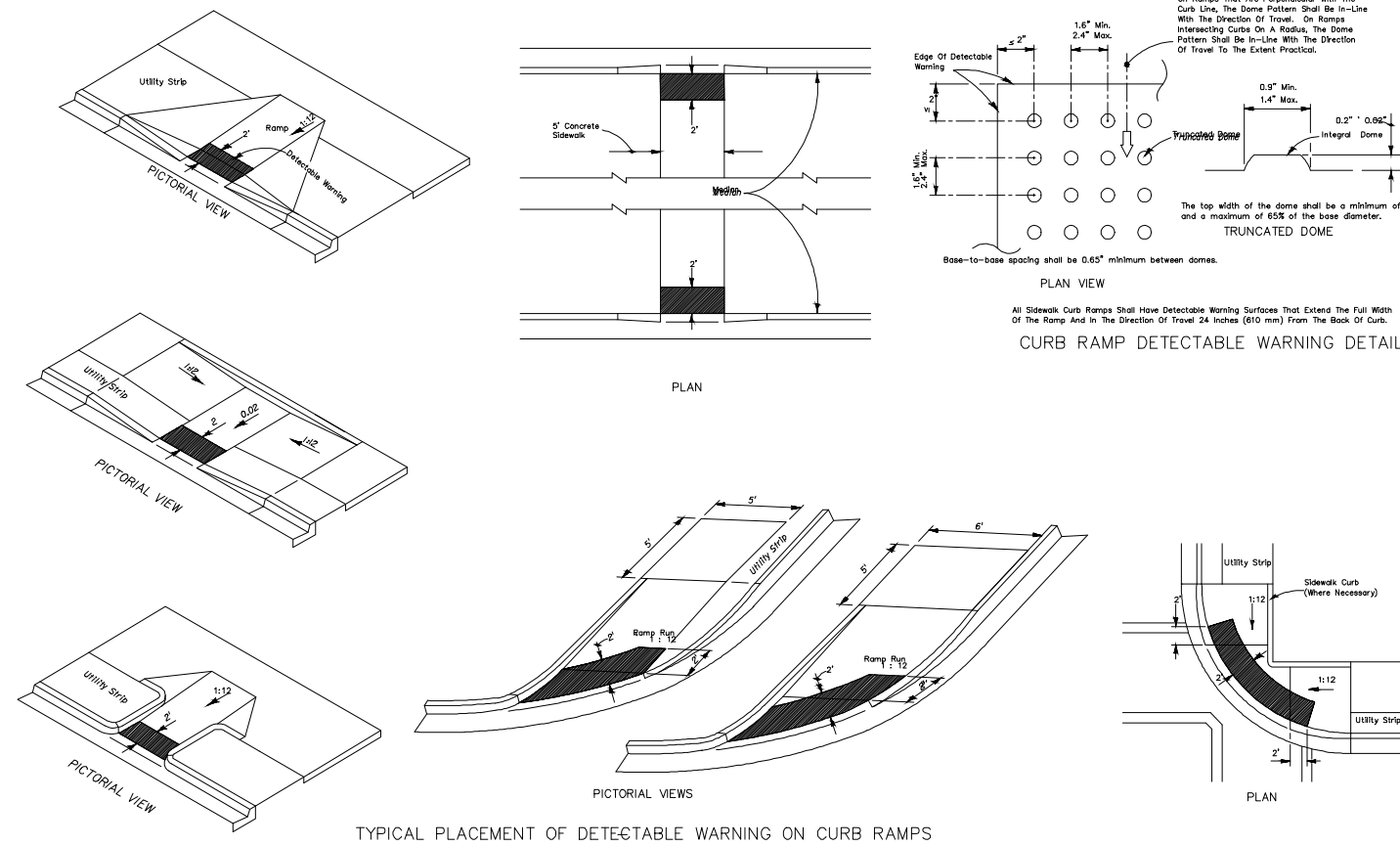
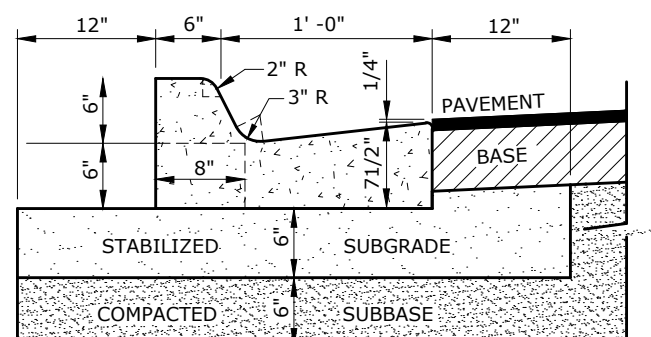
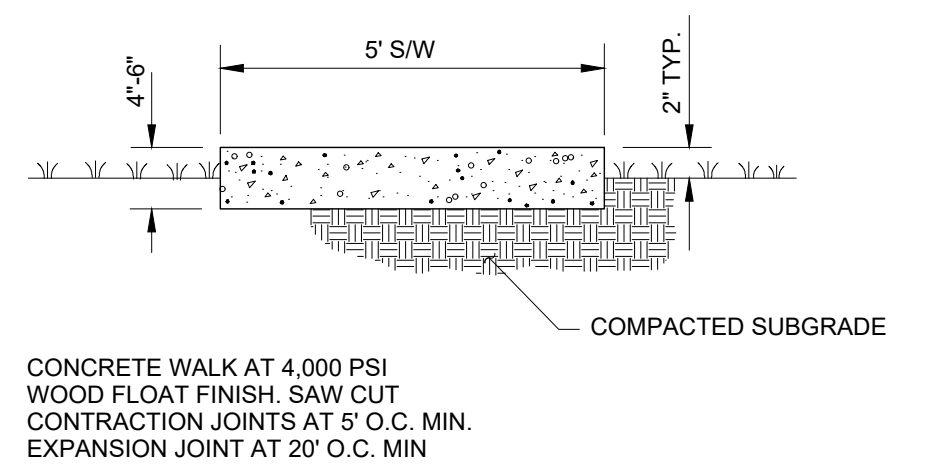
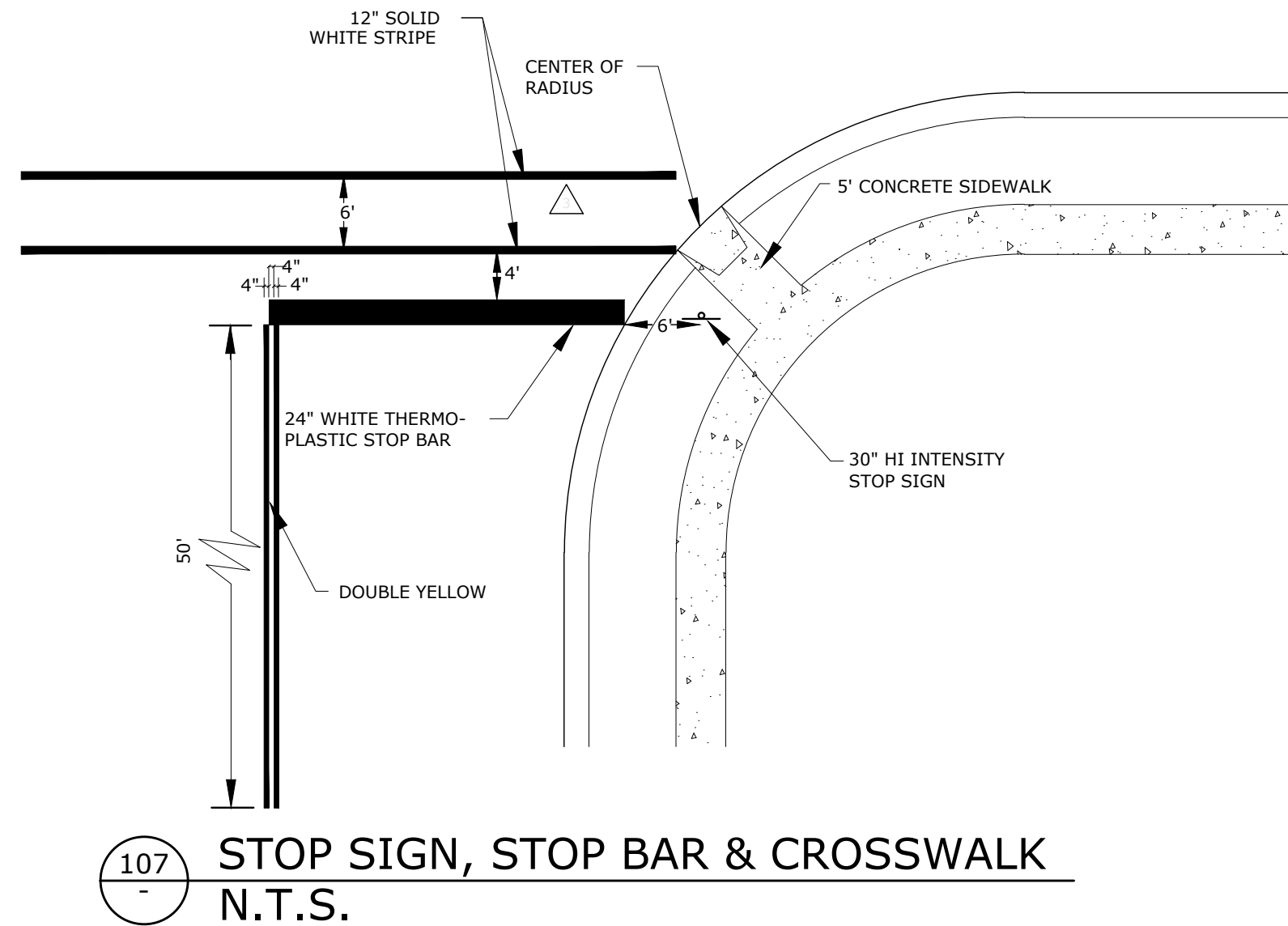
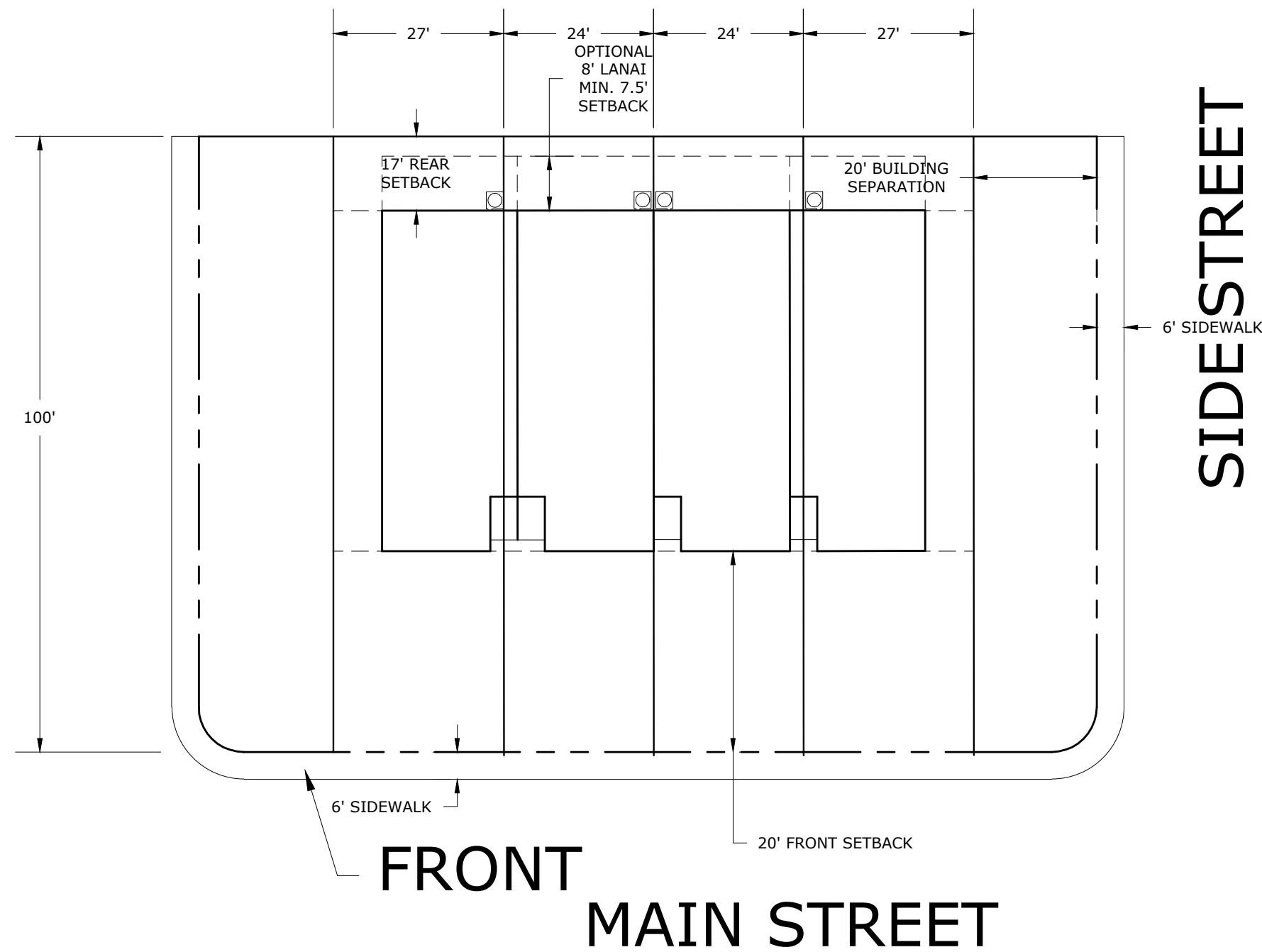
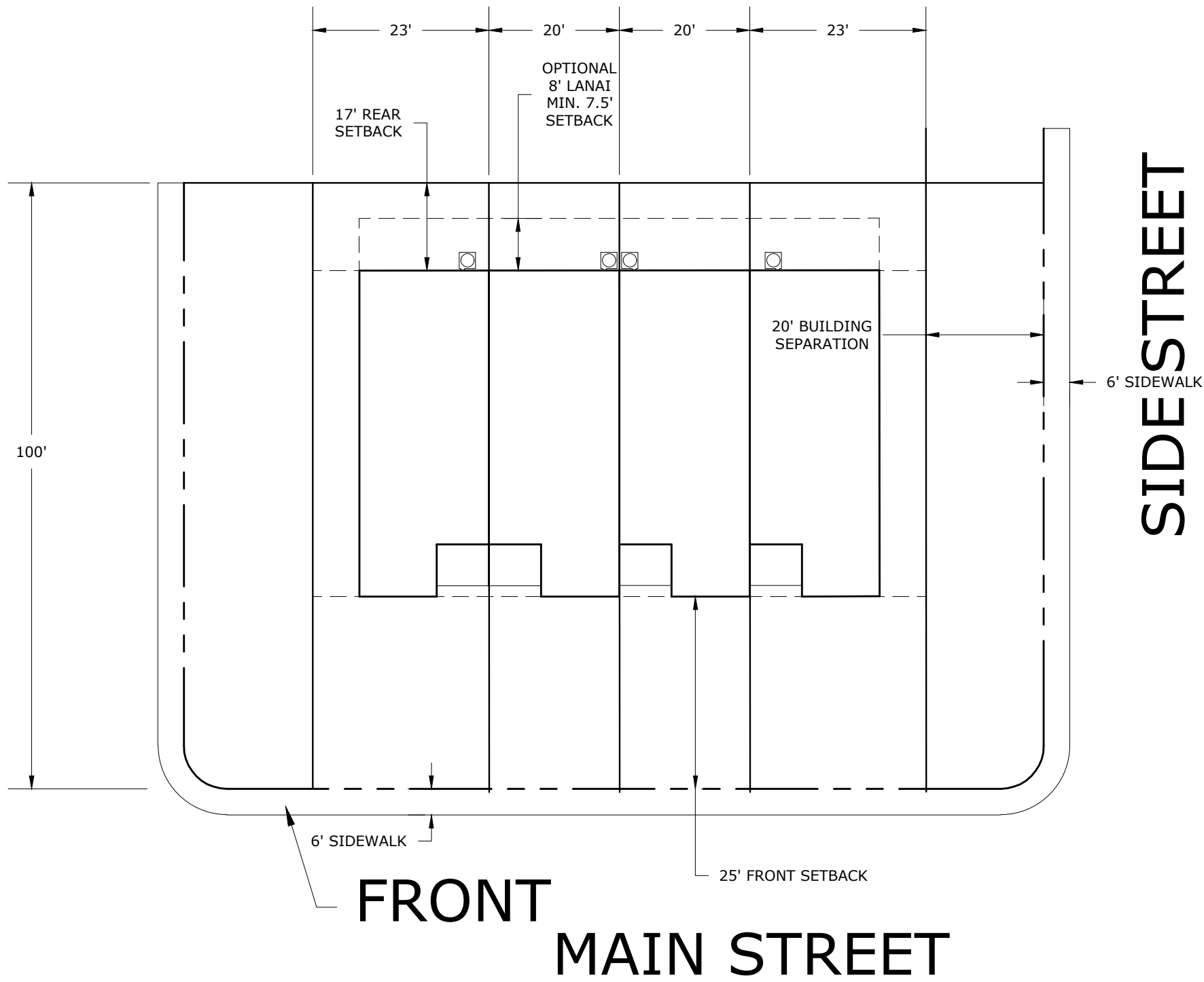
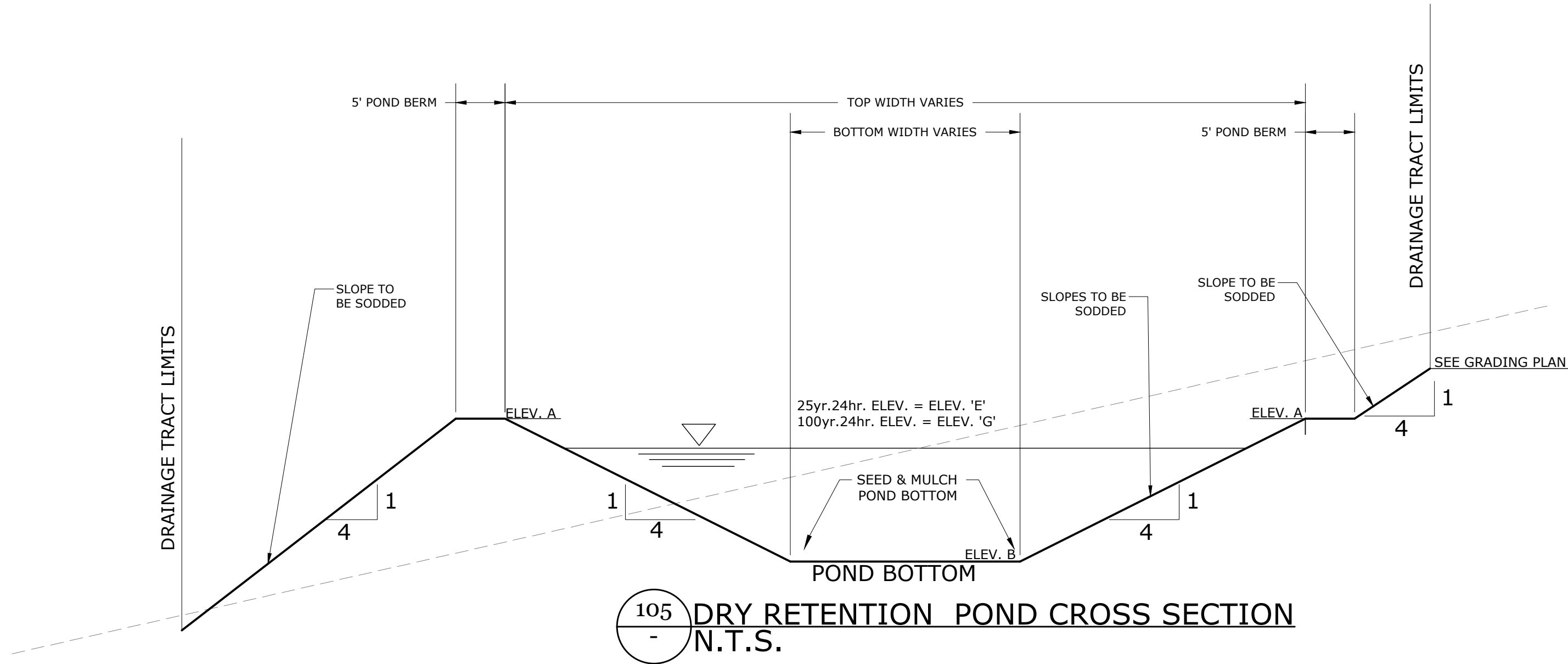
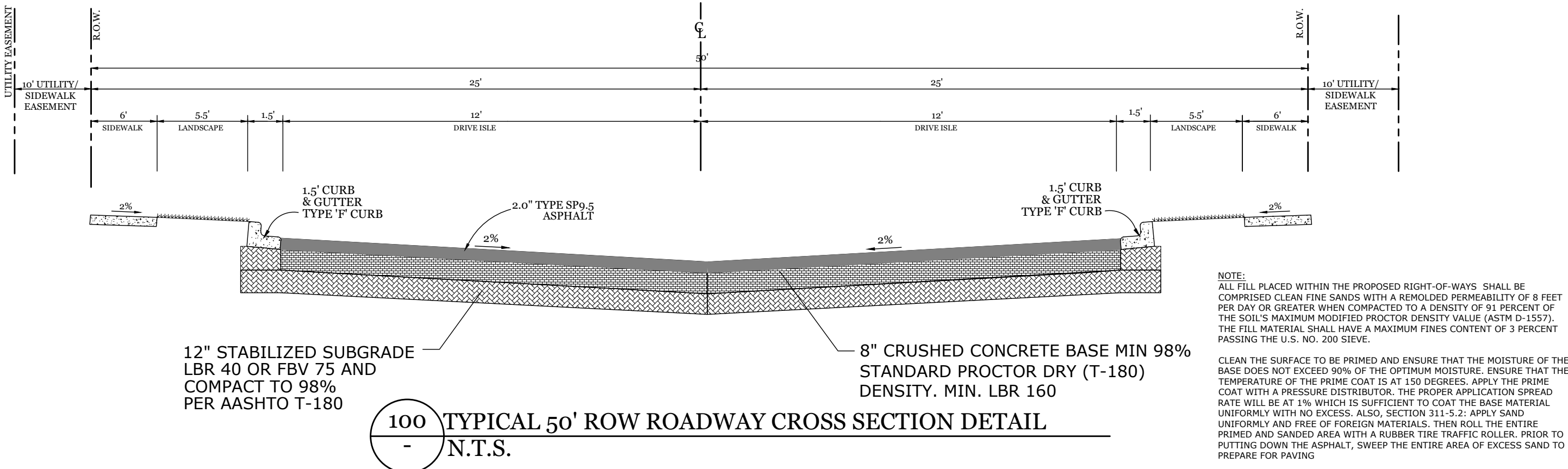
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Gardenia Pointe
Townhomes
City of Ocoee, Florida

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Master Plan

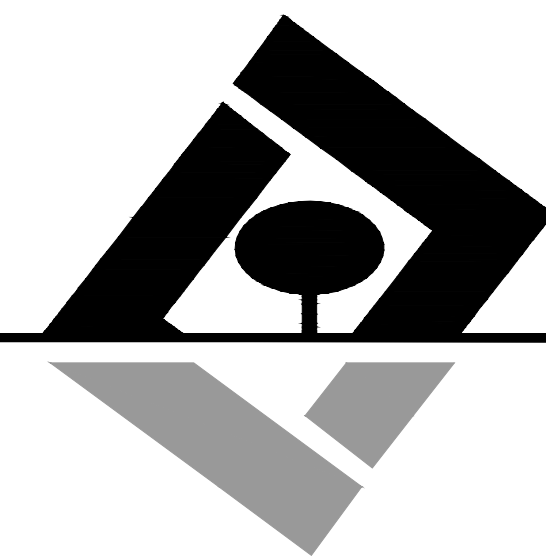
General Details

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Architectural
Elevations 1

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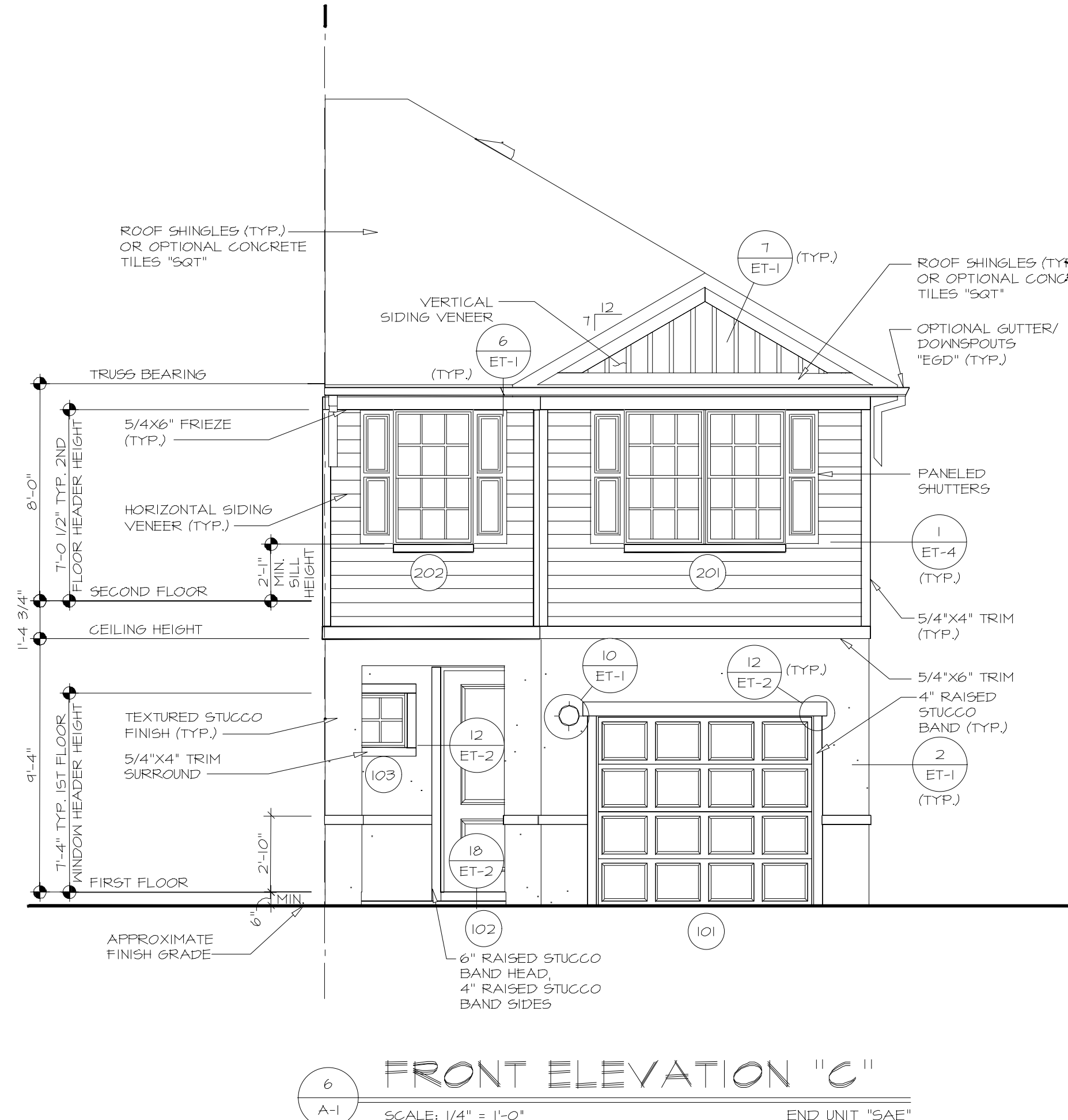
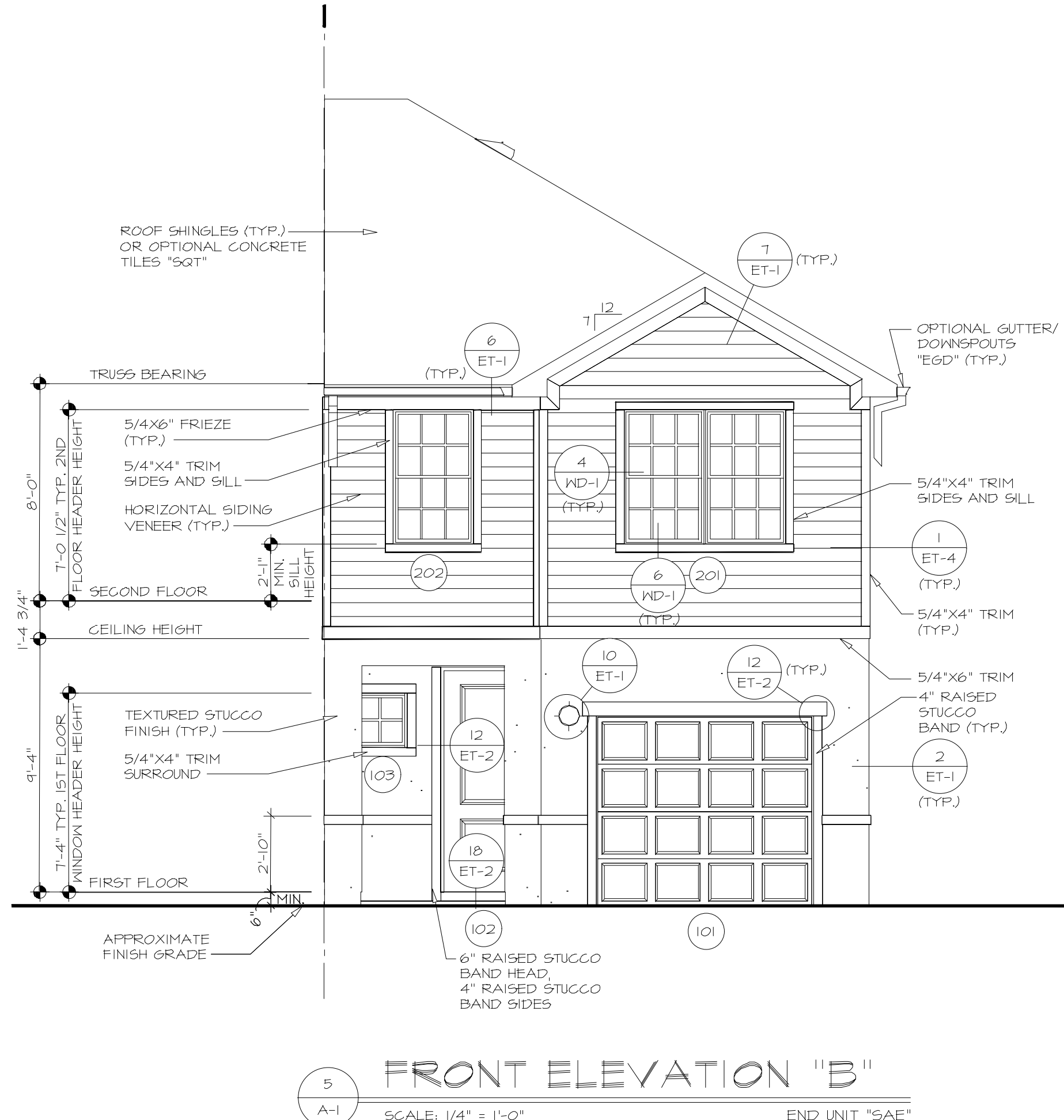
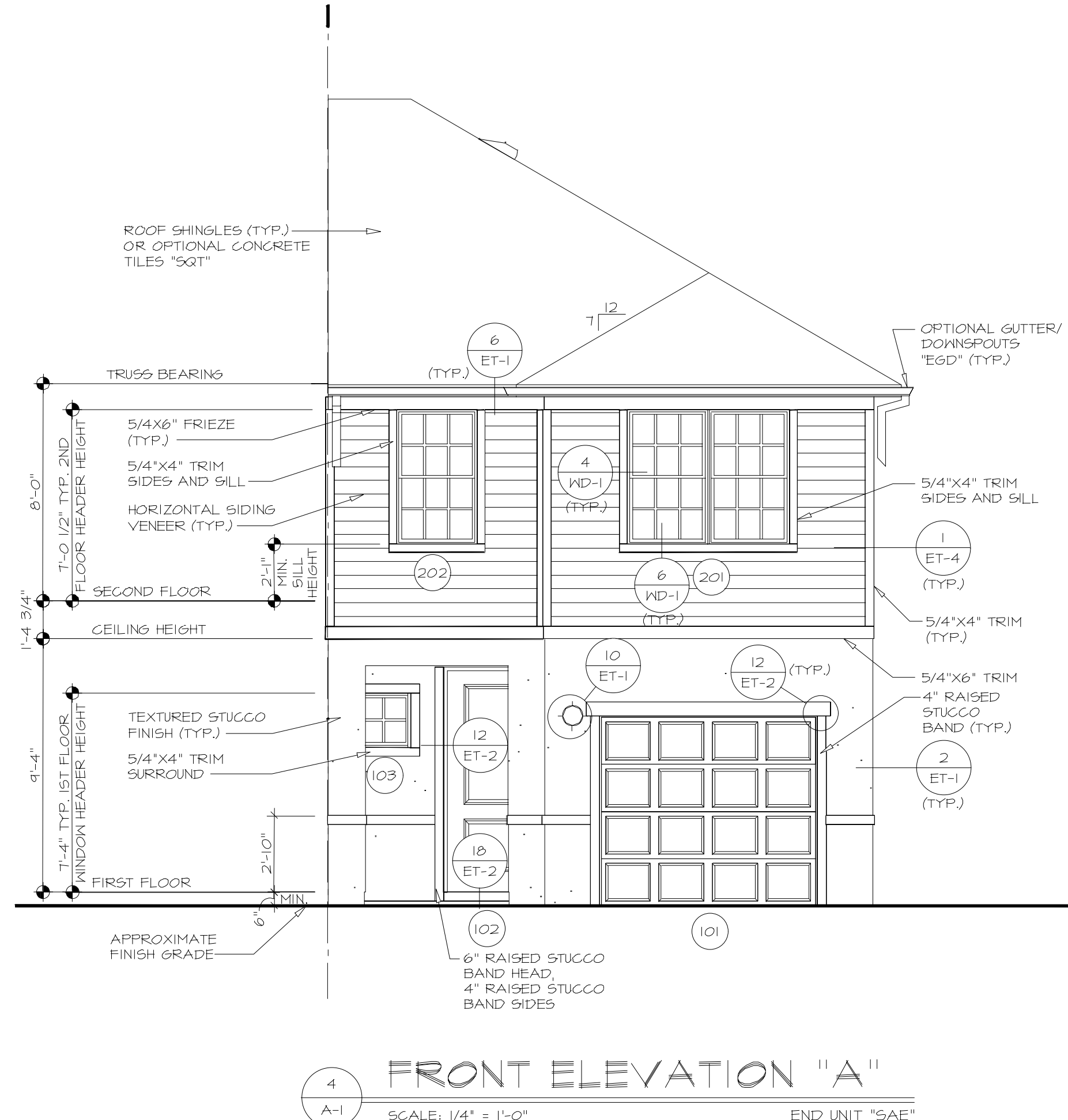
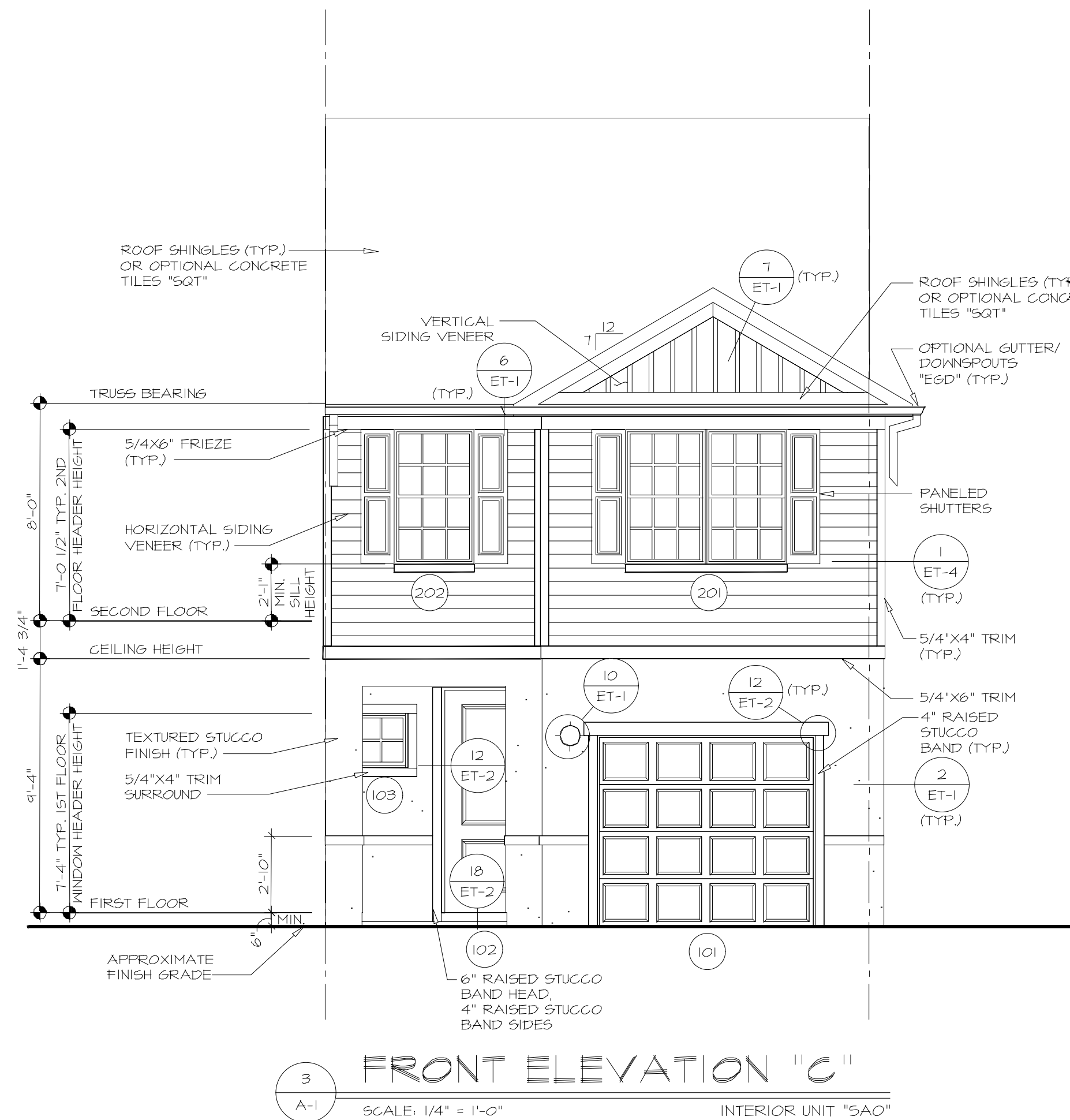
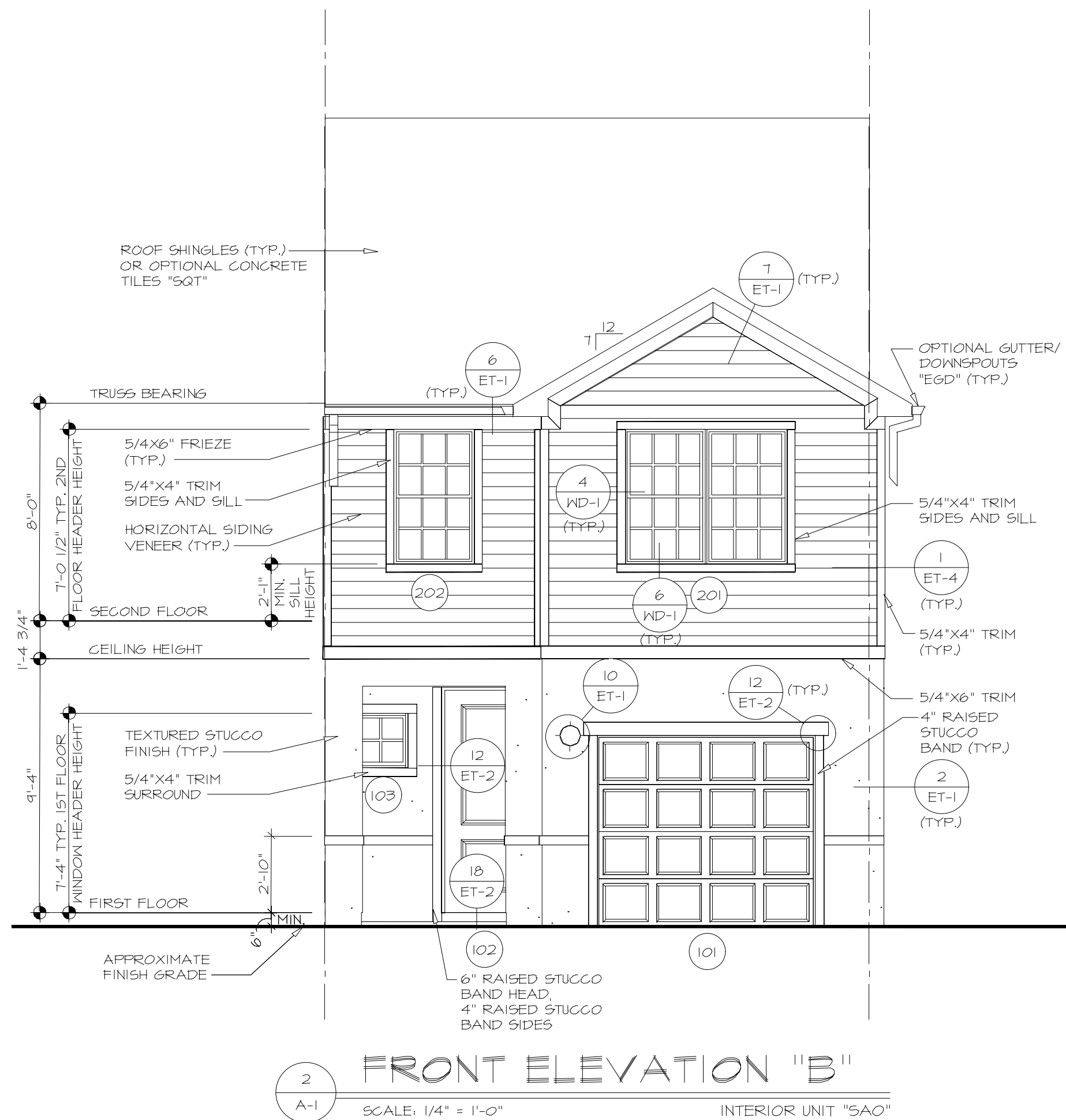
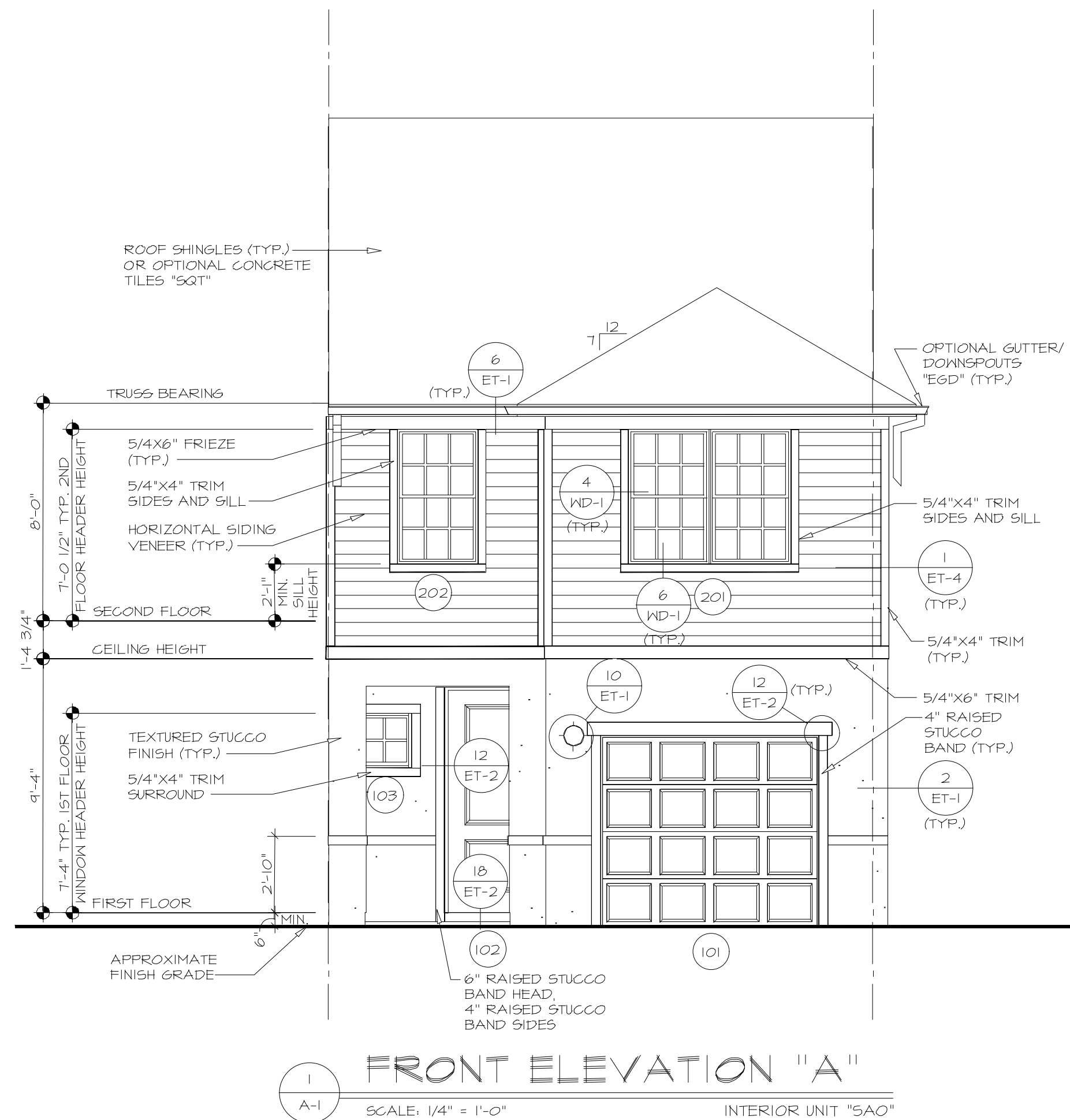
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5		
6		
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SHEET NUMBER

8 OF 11





1 2 - UNIT BUILDING
B-2 SCALE: 1/8" = 1'-0" MPTA2



2 2 - UNIT BUILDING
B-2 SCALE: 1/8" = 1'-0" MPTB2



3 2 - UNIT BUILDING
B-2 SCALE: 1/8" = 1'-0" MPTC2



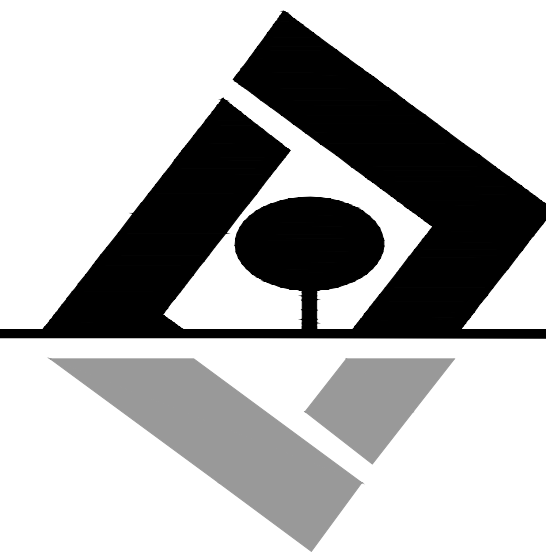
4 3 - UNIT BUILDING
B-2 SCALE: 1/8" = 1'-0" MPTO3



5 4 - UNIT BUILDING
B-2 SCALE: 1/8" = 1'-0" MPTO4



6 5 - UNIT BUILDING
B-2 SCALE: 1/8" = 1'-0" MPTO5



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City of Ocoee, Florida

Planned Development
Master Plan

Architectural
Elevations 2

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9 OF 11



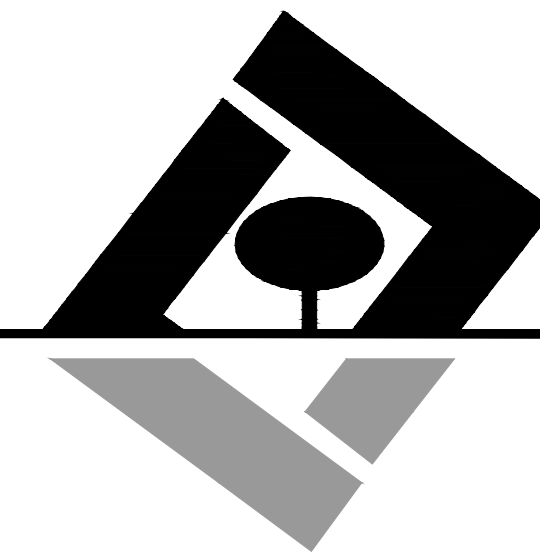
1
B-3
6 - UNIT BUILDING
SCALE: 1/8" = 1'-0"
MPT06



2
B-3
7 - UNIT BUILDING
SCALE: 1/8" = 1'-0"
MPT07



3
B-3
8 - UNIT BUILDING
SCALE: 1/8" = 1'-0"
MPT08



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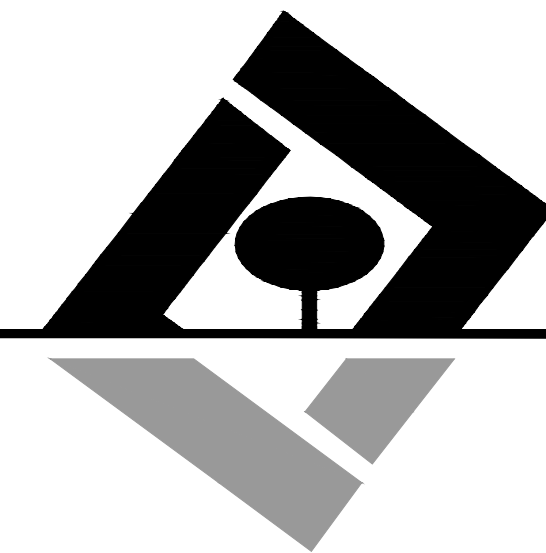
Architectural
Elevations 3

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11 OF 11

STANDARD BUILDING CONFIGURATION



**ORDINANCE NO. 2024-
(Rezoning Ordinance for Gardenia Pointe)**

**TAX PARCEL ID: 10-22-28-0000-00-003,
10-22-28-0000-00-011, 10-22-28-0000-00-128
and 03-22-28-2834-01-201**

CASE NO. RZ-23-02-02: Gardenia Pointe

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, CHANGING THE ZONING CLASSIFICATION FROM UNCLASSIFIED AND R-1A (SINGLE FAMILY DWELLING DISTRICT) TO PUD (PLANNED UNIT DEVELOPMENT DISTRICT) ON CERTAIN REAL PROPERTY CONTAINING APPROXIMATELY 37.37 ACRES LOCATED ON THE NORTH SIDE OF THE FCEN RAILROAD TRACKS AT THE TERMINUS OF THE UNIMPROVED OCOEE VISTA PARKWAY RIGHT-OF-WAY AND ASSIGNED PARCEL IDENTIFICATION NUMBERS 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128 AND 03-22-28-2834-01-201; FINDING SUCH ZONING TO BE CONSISTENT WITH THE OCOEE COMPREHENSIVE PLAN; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY ZONING MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the owner (the “Applicant”) of certain real property located within the corporate limits of the City of Ocoee, Florida, as hereinafter described, has submitted an application to the City Commission of the City of Ocoee, Florida (the “Ocoee City Commission”) to rezone said real property (the “Rezoning”); and

WHEREAS, the Applicant seeks to rezone certain real property containing approximately 37.37 acres, more particularly described in Exhibit “A” attached hereto and by this reference made a part hereof, from Unclassified and R-1A to PUD; and

WHEREAS, pursuant to Section 5-9(B) of Article V of the Land Development Code of the City of Ocoee, Florida (the “Ocoee City Code”), the City Development Services Director has reviewed said Rezoning application and determined that the Rezoning is consistent with the City of Ocoee Comprehensive Plan as set forth in Ordinance No. 91-28, adopted September 18, 1991, as amended (the “Ocoee Comprehensive Plan”); and

WHEREAS, said Rezoning application was scheduled for review and recommendation by the Planning and Zoning Commission of the City of Ocoee, Florida (the “Planning and Zoning Commission”), acting as the Local Planning Agency; and

WHEREAS, on February 13, 2024, the Planning and Zoning Commission held a public hearing and reviewed said Rezoning application for consistency with the Ocoee Comprehensive Plan and determined that the Rezoning is consistent with the Ocoee Comprehensive Plan and is in

the best interest of the City, and recommended to the Ocoee City Commission that the zoning classification of said real property be rezoned as requested by the Applicant and that the Ocoee City Commission find that the Rezoning requested by the Applicant to be consistent with the Ocoee Comprehensive Plan; and

WHEREAS, on May 7, 2024, the Ocoee City Commission held a de novo advertised public hearing with respect to the proposed Rezoning of said real property and determined that the Rezoning is consistent with the Ocoee Comprehensive Plan; and

WHEREAS, this Ordinance has been considered by the Ocoee City Commission in accordance with the procedures set forth in Section 166.041(3)(a), Florida Statutes.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COMMISSION OF THE CITY OF OCOEE, FLORIDA, AS FOLLOWS:

SECTION 1. AUTHORITY. The Ocoee City Commission has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapters 163 and 166, Florida Statutes.

SECTION 2. REZONING. The zoning classification, as defined in the Ocoee City Code, of the Property described in **Exhibit “A”** containing approximately 37.37 acres located within the corporate limits of the City of Ocoee, Florida, is hereby changed from Unclassified District and R-1A (Single Family Dwelling) District to PUD (Planned Unit Development) District. A map of said land herein described which clearly shows the area of the Rezoning is attached hereto as **Exhibit “B”** and by this reference is made a part hereof.

SECTION 3. COMPREHENSIVE PLAN. The Ocoee City Commission hereby finds the Rezoning of the land described in this Ordinance to be consistent with the Ocoee Comprehensive Plan.

SECTION 4. ZONING MAP. The City Clerk is hereby authorized and directed to revise the Official Zoning Map of the City of Ocoee in order to incorporate the Rezoning enacted by this Ordinance, and the Mayor and City Clerk are hereby authorized to execute said revised Official Zoning Map in accordance with the provisions of Section 5-1(G) of Article V of the Ocoee City Code.

SECTION 5. CONFLICTING ORDINANCES. This ordinance prevails in the event of any inconsistency with all ordinances or parts of ordinances in conflict herewith.

SECTION 6. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion hereto.

SECTION 7. EFFECTIVE DATE. This Ordinance shall become effective ten (10) days after its passage and adoption.

PASSED AND ADOPTED this _____ day of _____, 2024.

ATTEST:

**APPROVED:
CITY OF OCOEE, FLORIDA**

Melanie Sibbitt, City Clerk

Rusty Johnson, Mayor

(SEAL)

ADVERTISED _____, 2024
READ FIRST TIME _____, 2024.
READ SECOND TIME AND ADOPTED
_____, 2024.
UNDER AGENDA ITEM NO. _____

**FOR USE AND RELIANCE ONLY BY THE
CITY OF OCOEE, FLORIDA; APPROVED AS
TO FORM AND LEGALITY**
this _____ day of _____, 2024.

FISHBACK DOMINICK

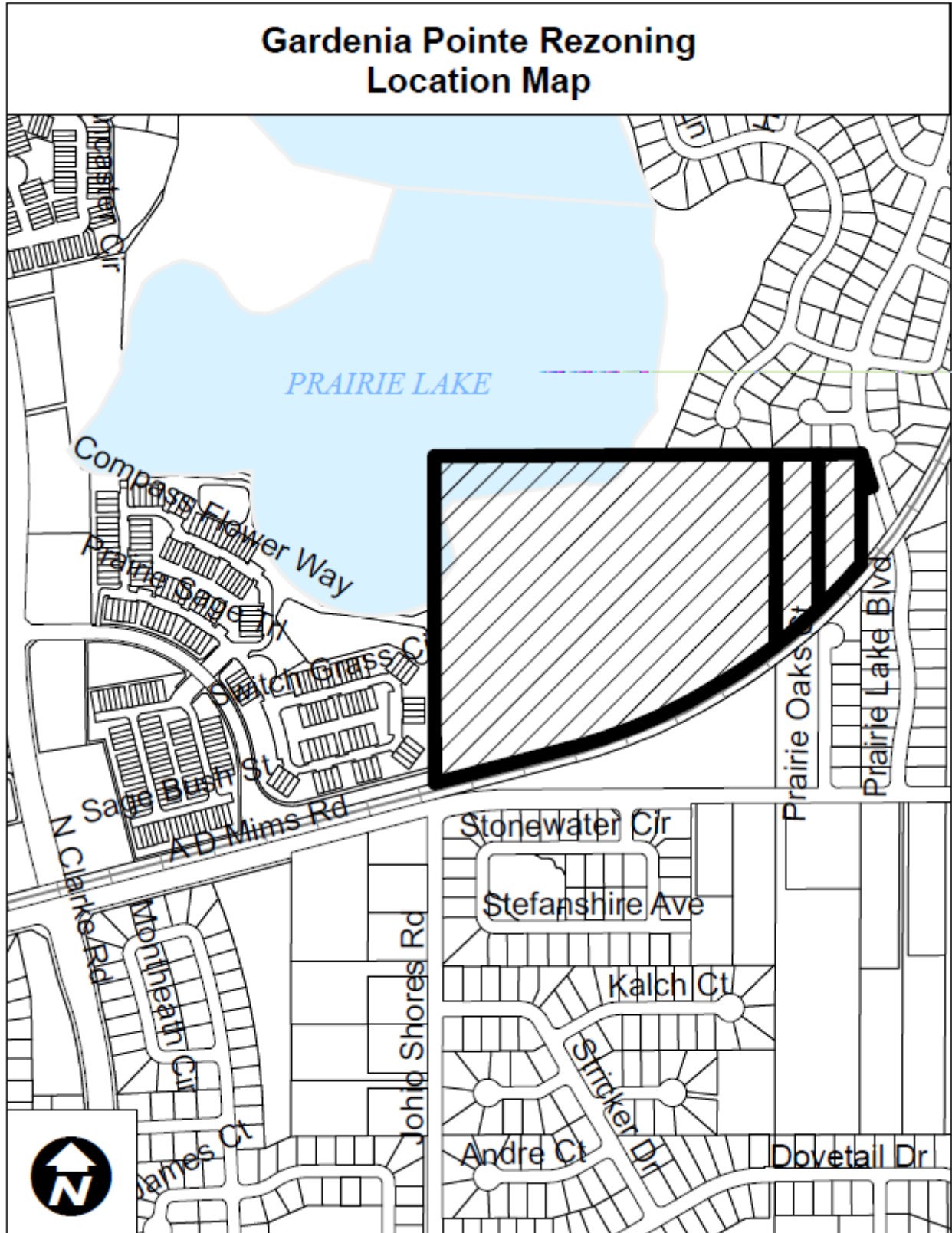
By: _____
City Attorney

EXHIBIT "A"

LEGAL DESCRIPTION

1. PARCEL ID NO.: 10-22-28-0000-00-003
SW1/4 OF NW1/4 (LESS THAT PART LYING S OF ACL RR) OF SEC 10-22-28
2. PARCEL ID NO.: 10-22-28-0000-00-011
W1/8 OF SE1/4 OF NW1/4 LYING N OF SEABOARD COASTLINE R/R & FLORIDA CENTRAL R/R IN SEC 10-22-28
3. PARCEL ID NO.: 10-22-28-0000-00-128
E1/2 OF W1/4 OF SE1/4 OF NW1/4 LYING N OF SCL RR IN SEC 10-22-28
4. PARCEL ID NO.: 03-22-28-2834-01-201
FOREST OAKS UNIT 1 13/84 BEG AT N COR OF LOT 120 TH S 18 DEG E 135 FT S 71 DEG W 44.77 FT N 142.33 FT TO POB

EXHIBIT "B"



West Orange Times c/o Business Observer

1970 Main Street
3rd Floor
Sarasota, FL 34236
, 941-906-9386 x322

INVOICE

Legal Advertising

**CITY OF OCOEE
NOTICE OF PUBLIC HEARING TO CONSIDER THE
GARDENIA POINTE
REZONING FROM UNCLASSIFIED DISTRICT & R-1A (SINGLE FAMILY
DWELLING) DISTRICT TO PUD (PLANNED UNIT DEVELOPMENT)
DISTRICT
CASE NUMBER: RZ-23-02-02**

NOTICE IS HEREBY GIVEN, pursuant to Article I, Sections 1-9 and 1-10, Article IV, Section 4-5, and Article V, Section 5-9, of the City of Ocoee Land Development Code, that on **TUESDAY, MAY 21, 2024, AT 6:15 P.M.** or as soon thereafter as practical, the **OCOEE CITY COMMISSION** will hold a **PUBLIC HEARING** at the City of Ocoee Commission Chambers located at 1 North Bluford Avenue, Ocoee, Florida, to consider the Rezoning from Unclassified District and R-1A (Single Family Dwelling) District to PUD (Planned Unit Development) District for the Gardenia Pointe townhome development. The subject property consists of four (4) parcels assigned Parcel ID #s 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128, and 03-22-28-2834-01-201 and combined totals approximately 37.37 acres. Development of the proposed townhome subdivision will occur on the uplands portion of parcel number 10-22-28-0000-00-003 only and will be accessed via completion of the Ocoee Vista Parkway within the existing City road right-of-way. The property is located on the north side of the FCEN Railroad tracks at the terminus of the unimproved Ocoee Vista Parkway right-of-way.

AN ORDINANCE OF THE CITY OF OCOEE, FLORIDA, CHANGING THE ZONING CLASSIFICATION FROM UNCLASSIFIED AND R-1A (SINGLE FAMILY DWELLING DISTRICT) TO PUD (PLANNED UNIT DEVELOPMENT DISTRICT) ON CERTAIN REAL PROPERTIES CONTAINING APPROXIMATELY 37.37 ACRES LOCATED ON THE NORTH SIDE OF THE FCEN RAILROAD TRACKS AT THE TERMINUS OF THE UNIMPROVED OCOEE VISTA PARKWAY RIGHT-OF-WAY AND ASSIGNED PARCEL IDENTIFICATION NUMBERS 10-22-28-0000-00-003, 10-22-28-0000-00-011, 10-22-28-0000-00-128 AND 03-22-28-2834-01-201; FINDING SUCH ZONING TO BE CONSISTENT WITH THE OCOEE COMPREHENSIVE PLAN; PROVIDING FOR AND AUTHORIZING THE REVISION OF THE OFFICIAL CITY ZONING MAP; PREVAILING IN THE EVENT OF ANY INCONSISTENCY; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

Interested parties may appear at the public hearing and be heard with respect to the proposed action. The complete case file may be inspected at the Ocoee Development Services Department, located at 1 North Bluford Avenue, Ocoee, Florida, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, except for legal holidays. The City Commission may continue the public hearing to other dates and times as it deems necessary. Any interested party shall be advised that the dates, times, and places of any continuation of these or continued public hearings shall be announced during the hearings and that no further notices regarding these matters will be published. You are advised that any person who desires to appeal any decision made during the public hearings will need a record of the proceedings and, for this purpose, may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. Persons with disabilities needing assistance to participate in any of the proceedings should contact the City Clerk's Office 48 hours in advance of the meeting at (407) 905-3105. Melanie Sibbitt, City Clerk
May 9, 2024

24-01512W

Attention: If you are a government agency and you believe that you qualify for a 15% discount to the second insertion of your notice per F.S. revision 50.061, please inform Kristen Boothroyd directly at 941-906-9386 x323.

NOTICE

The Business Observer makes every effort to ensure that its public notice advertising is accurate and in full compliance with all applicable statutes and ordinances and that its information is correct. Nevertheless, we ask that our advertisers scrutinize published ads carefully and alert us immediately to any errors so that we may correct them as soon as possible. We cannot accept responsibility for mistakes beyond bearing the cost of republishing advertisements that contain errors.