MASTER LIFT STATION NO. 4 (MLS4) PUMP, MOTOR AND CONTROL PANEL REPLACEMENT

INVITATION FOR BID # PSUT-25-13

Issuance of Solicitation: Tuesday, December 16, 2025

Questions Due Date: Tuesday, December 30, 2025

Bid Submission Deadline: Tuesday, January 20, 2026

THE CITY OF PEMBROKE PINES
PROCUREMENT DEPARTMENT
8300 SOUTH PALM DRIVE
PEMBROKE PINES, FLORIDA 33025
(954) 518-9020

For more information, please visit our online supplier portal, located at
https://procurement.opengov.com/portal/pembrokepines

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SECTION 1 - NOTICE

Notice is hereby given that the City Commission of the City of Pembroke Pines is seeking sealed proposals for:

IFB # PSUT-25-13

Master Lift Station No. 4 (MLS4) Pump, Motor and Control Panel Replacement

Solicitations may be found on the City of Pembroke Pines website under the Procurement Department at http://www.ppines.com/index.aspx?NID=667, and may be downloaded directly from the OpenGov platform at https://procurement.opengov.com/portal/pembrokepines.

For Technical Support, proposers can reach the OpenGov Service Desk between 7:00 am to 10:00 pm from Monday through Friday via the following methods:

- Chat (preferred method): Click the button in the lower right-hand corner of the portal.
- E-mail: procurement-support@opengov.com
- Phone: 1 (650) 336-7167

If additional help is needed with downloading the solicitation package please contact the Procurement Department at (954) 518-9020 or by email at purchasing@ppines.com. The Procurement Department hours are between 7:00 am to 6:00 pm on Monday through Thursday and is located at 8300 South Palm Drive, Pembroke Pines, FL 33025.

Bidders shall submit all questions regarding this bid via the City's e-Procurement Portal, located at https://procurement.opengov.com/portal/pembrokepines. Please note the deadline for submitting questions. All answers will be posted on the City's e-Procurement Portal. Bidders may also click "Follow" on this bid to receive an email notification when answers are posted. It is the bidder's responsibility to check the portal for updates. Only written responses issued through the OpenGov platform will be considered official for interpretations or clarifications.

Proposals will be accepted until 2:00 pm on Tuesday, January 20, 2026, electronically at https://procurement.opengov.com/portal/pembrokepines/projects/220070.

Bid Opening: The sealed electronic proposals will be publicly opened at 2:30 pm, on the bid due date, by the City Clerk's Office, in the **City Clerk's Office Conference Room located on the 4th Floor in the Charles F. Dodge City Center/**City Hall Administration Building, located at 601 City Center Way, Pembroke Pines, Florida, 33025.

Virtual Bid Opening: In light of public health concerns and to ensure accessibility for all, the City encourages interested parties and the public to participate virtually via live streaming instead of attending the meeting in person. As a result, meetings may be a combination of in-person and virtual, all as provided by law. To virtually attend the bid opening, please use the Cisco Webex Meetings platform.

Virtual Meeting Details:

- WebEx Meeting Link: https://ppines.webex.com/meet/purchasing
- Cisco Webex Meeting Number: 717 019 586
- Join by Phone Number: +1-408-418-9388

The public may download the **Cisco Webex Meetings app** from https://www.webex.com/downloads.html/.

To ensure an efficient meeting process, participants are requested to mute their audio and camera during the meeting. While the public is welcome to attend the virtual bid opening, **please note that active participation and commenting will not be allowed during the proceedings.**

For further information about the bid opening or assistance in accessing the virtual meeting, please contact:

Jamie Chen or other Procurement Staff in the Procurement Department
City of Pembroke Pines
8300 South Palm Drive,
Pembroke Pines, FL 33025
(954) 518-9061 or 954-518-9020
purchasing@ppines.com

SECTION 2 - GENERAL PROJECT INFORMATION & TIMELINE

2.1 Project Timeline

The work shall be completed within **180** calendar days from issuance of the City's Notice to Proceed (NTP), with an estimated start date of **TBD**.

2.2 Tentative Schedule of Events

Issuance of Solicitation (Posting Date):	December 16, 2025
Pre-Bid Meeting (Mandatory):	December 22, 2025, 10:30am SE CORNER OF WASHINGTON ST AND SW 114 AVE
Question Due Date:	December 30, 2025, 11:30pm
Issuance of Final Answers to Questions:	January 6, 2026
Bid Submission Deadline:	January 20, 2026, 2:00pm
Bid Opening:	Will be held at 2:30 pm on the day of bid submissions are due.

2.3 Mandatory Pre-Bid Meeting/Site Visit

There will be a **MANDATORY** scheduled pre-bid meeting on **Monday, December 22, 2025 at 10:30 am.** Meeting location will be at the **SE CORNER OF WASHINGTON ST AND SW 114 AVE**

A. **Proof of Attendance: Contractor**s may be required to sign in at any of the meetings to show proof of attendance. It is the **Contractor**'s responsibility to make sure that they sign in at the meeting.

2.4 Follow-Up Pre-Bid Meeting(s)

Follow-Up Meetings: In the event that a **Contractor** cannot attend the scheduled pre-bid meeting, or if a **Contractor** would like a follow up visit to the site, they may request a site visit by contacting **Jamie Chen** at **(954) 518-9061**. We urge all **Contractor**s to attend the scheduled meeting, as a separate or follow-up meeting may not be afforded to the requester due to scheduling and availability of staff to assist with any additional meetings. In addition, if making a request for a separate or follow-up meeting, **Contractor**s are urged to make these requests as early as possible.

2.5 Estimated Project Cost

$1,130,000.

2.6 Liquidated Damages

Liquidated damages for this project shall be **ONE THOUSAND DOLLARS AND NO CENTS ($1000.00)** per day.

2.7 Grant/Federal Funding

Not applicable for this project.

2.8 Proposal Security/Bid Bond

A Proposal Security shall be required, only for bidders that have a total cumulative base proposal amount that exceeds $200,000. Proposal Security shall be in the amount of 5% of the total cumulative base amount proposed.

2.9 Payment and Performance Bonds

Regardless of the awarded contract amount, two (2) separate bonds (Payment and Performance Bonds) are required, and both must be approved by the City. The penal sum stated in each bond shall be 100% of the contract price.

2.10 Permit, License, Impact or Inspection Fees

With the exception of the City related permit, license, impact or inspection fees (including the Building Department and Engineering Department Permit Fees), which will be waived for this project, the City does not anticipate any additional permit, license, impact or inspection fees for this project. Any related State or County fees, for the aforementioned permits, will be paid by the City.

In addition, the City shall cover the cost for any other permit fees related to external entities through the City's Owner's Contingency for this project**, therefore proposers should not include permit costs in their total proposal price.**

Furthermore, please note the City's average time for a **Contractor** to apply for and receive an approved permit is 30 days; delays in this timeline caused by the **Contractor**'s failure to actively monitor the permit process and submit all required documentation in a timely manner, will count against the project's contractual completion period.

SECTION 3 - PURPOSE AND BACKGROUND

3.1 Purpose

The City of Pembroke Pines is seeking bids from qualified firms, hereinafter referred to as the Contractor, to replace the existing pumps, motors, and control panels at Master Lift Station No. 4 located at the SE corner of Washington St. and SW 114th Ave, in accordance with the terms, conditions, and specifications contained in this solicitation.

The Project includes bypass pumping, cleaning, demolition and replacement of the dry pit pumping system, new electrical service, fixtures, and control panel, and startup/testing to ensure proper functionality as specified in the Contract Documents.

3.2 Background

Pembroke Pines, Florida, ranked as the eleventh largest city among the state's four hundred plus municipalities and the second largest in Broward County, maintains a welcoming small-town ambiance that resonates with its residents. Located conveniently in southwest Broward County, the city provides seamless access to major highways, employment centers, entertainment venues, parks, golf courses, and a diverse array of dining and shopping options.

With a population of approximately 170,000 residents spread across 32.68 square miles, Pembroke Pines is renowned as one of the best cities to live in America. The city boasts 28 superior parks, lush landscaping, and a distinctive South Florida charm that contributes to its natural beauty. Notably recognized as 2024's Best Place to Raise a Family in Florida, and 2024's Best City of Hispanic Entrepreneurs by WalletHub, Pembroke Pines also earned a place as the on Money Magazine's esteemed Best Places to Live list in 2014, as the sole Florida representative, ranking in at #32 in the nation.

Incorporated in 1960, Pembroke Pines is celebrated as a safe and desirable community, having received accolades such as the All-America City designation. The city's commitment to arts and culture, exceptional schools, diverse population, numerous parks, and forward-thinking approach in an ever-evolving world make it a standout destination.

Pembroke Pines is also the home to the largest municipal-run charter school system in the nation, serving over 6,000 students across five separate campuses. The City’s award-winning charter school system is located in the Broward County School District, which is the sixth largest school district in the nation.

SECTION 4 - SCOPE OF WORK

4.1 General Summary

Below is a general list of services required for the construction. This list is not intended to be comprehensive. Please refer to Attachment A: 2025-10-14 – MLS #4 Bid Specifications for full requirements outlined in this bid package. The plans for Master Lift Station No. 4 are also included; see Attachment B: 2025-10-14 – MLS #4 Bid Plans.

The project involves the following descriptions of work:

- Replace three existing 50 HP pump and motor assemblies with new 60 HP submersible units in the existing MLS#4 dry pit.
- Remove and replace associated electrical components, including conduit, wiring, disconnects, and control panels.
- Ensure new equipment matches existing configuration to avoid modifications to valves and fittings.
- Provide temporary pumping during construction and perform system startup and testing.

SECTION 5 - PRICE PROPOSAL / BID TABLE

The vendor must provide their pricing electronically through the designated line items listed on the Bid Sheet/Pricing Table via the City's e-Procurement portal on OpenGov.

Vendor Notes: The bid tables includes a "Vendor Notes" column for any additional comments regarding the requested line item(s). A comment is preferred in the "Vendor Notes" column. If the vendor does not need to submit any comments, they may leave it blank or enter N/A or similar.

Payment & Performance Bonds: The table includes a section for the vendor to submit pricing for Payment & Performance Bonds. If the total cumulative base proposal amount does not exceed $200,000 and a Payment and Performance Bond is not required, please enter "0" on the "If Applicable, Cost for Payment and Performance Bond" column for each line item.

Primary Responses: The initial Bid Table is for the primary responses so that the vendors can submit the requested goods and/or services.

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Vendor Notes
1	Master Lift Station #4 (MLS#4) Pump, Motor and Control Panel Replacement	1	Lump Sum			
TOTAL						

PAYMENT & PERFORMANCE BOND

Line Item	Description	Unit of Measure	Percentage
1	Payment & Performance Bond	%	

SECTION 6 - SUBMITTAL DOCUMENTS

Bids must be submitted electronically at https://procurement.opengov.com/portal/pembrokepines on or before **2:00 pm on Tuesday, January 20, 2026.** Please note vendors should be registered on OpenGov under the name of the organization that they are operating as and it should match the organization name on the documents that they are submitting and utilizing when responding to the solicitation. In addition, the vendor must complete the required documents in this section and provide any additional information requested throughout this solicitation. Any additional information requested in the solicitation should be scanned and uploaded. The City recommends for proposers to submit their proposals as soon as they are ready to do so. Please allow ample time to submit your proposals on the https://procurement.opengov.com/portal/pembrokepines website. Proposals may be modified or withdrawn prior to the deadline for submitting Proposals.

PLEASE DO NOT SUBMIT ANY PROPOSALS VIA MAIL, E-MAIL OR FAX.

Prospective proposers interested in responding to this solicitation are requested to provide all of the applicable information listed in this section. Submittals that do not respond completely to all of the requirements specified herein may be considered non-responsive and eliminated from the process. Brevity and clarity are encouraged.

1 CONFIRMATION TO BIND

1.1 I certify that I have read, understood and agree to the terms in this solicitation, and that I am authorized to submit this response on behalf of my company.*

☐ Please confirm

*Response required

2 CERTIFICATION OF INSURANCE COMPLIANCE AND INTENT TO PROCURE REQUIRED COVERAGE

NOTE: Vendors are not required to purchase any additional insurance in order to submit a bid. However, they must certify that they either currently hold, or are able and willing to obtain, all required insurance coverages, endorsements, and limits prior to award and execution of the contract.

2.1 I certify that, if awarded this contract, I will be required to obtain and maintain all insurance policies as detailed in the INSURANCE REQUIREMENTS Section of this solicitation before any work may commence, and throughout the life of the contract.*

☐ Please confirm

*Response required

2.2 Do you confirm that you will only use insurance carriers licensed to do business in the State of Florida and rated no less than “A” as to management, and no less than “Class VI” as to financial strength by A.M. Best, and that you understand all endorsements required (e.g., Additional Insured, Waiver of Subrogation, etc.) must be included?*

☐ Yes

☐ No

*Response required

2.3 Do you currently carry insurance policies that meet or exceed the minimum requirements outlined in the INSURANCE REQUIREMENTS section of this solicitation?*

☐ Yes

☐ No

*Response required

When equals "Yes"

2.3.1 Please upload your current certificate(s) of insurance that demonstrate compliance with the insurance requirements outlined in this solicitation.*
*Response required

When equals "No"

2.3.2 Please upload documentation showing that you have obtained a letter from your insurance broker or carrier, such as a Letter of Intent to Insure, Evidence of Insurability, or a Conditional Certificate of Insurance.*
Documentation should show that:

- You can obtain the required insurance.
- The limits and types of coverage will meet the INSURANCE REQUIREMENTS outlined in the solicitation.
- You will provide a COI upon contract award.

*Response required

When equals "No"

2.3.3 Please upload your current certificate(s) of insurance.*
*Response required

2.4 Do you believe you are exempt from one or more insurance requirements (e.g., Workers' Compensation)?*

☐ Yes

☐ No

*Response required

When equals "Yes"

2.4.1 Please upload written documentation requesting an exemption on your company letterhead, subject to City approval.*
*Response required

2.5 Do you plan on using subcontractors for this project?*

☐ Yes

☐ No

*Response required

When equals "Yes"

2.5.1 Do you acknowledge that all subcontractors must also carry the same insurance or be covered under your policy, and that proof of such coverage must be provided to the City?*

☐ Yes

☐ No

*Response required

3 REFERENCE # 1

The minimum experience for this project is **five (5) years**. Provide specific examples of similar experience conducting licensed work of equal or similar scope of work, preferably delivered by the proposed team members. A **minimum of 3** references should be from the last **five years** and should be capable of explaining and confirming your firm's capacity to successfully complete the scope of work outlined herein. As part of the proposal evaluation process, the City may conduct an investigation of references, including a record check or consumer affairs complaints. Proposers' submission of a proposal constitutes acknowledgment of the process and consent to investigate. The City is the sole judge in determining Proposers qualifications. In this section you will have the ability to enter information for 5 different references including their contact details and specific project information.

Please note that the City prefers references who are not current employees of the City of Pembroke Pines, as we generally do not contact our own employees for reference checks.

Proposers are advised to confirm that:

A. Each reference provided by the Respondent has up to date contact persons and contact information;

B. The contact person provided for each reference is someone who has personal knowledge of the Proposer's performance during the referenced project; and

C. The contact person for each reference has been contacted by the Proposer regarding this specific bid submittal and such person confirmed their willingness to serve as a reference.

3.1 Reference Contact Information - Name of Firm, City, County or Agency*
*Response required

3.2 Reference Contact Information - Reference's Business Address*
*Response required

3.3 Reference Contact Information - Reference's Contact Name & Title*
*Response required

3.4 Reference Contact Information - Reference's E-mail Address*
*Response required

3.5 Reference Contact Information - Reference's Phone Number*
*Response required

3.6 Project Information - Was your firm the prime contractor for the listed project?*
☐ Yes
☐ No

*Response required

3.7 Project Information - Name of Contactor Performing the Work*
*Response required

3.8 Project Information - Name and location of the project*
*Response required

3.9 Project Information - Nature of the firm's responsibility on the project and work for which staff was responsible for*
*Response required

3.10 Project Information - Project Duration*
*Response required

3.11 Project Information - Completion (Anticipated) Date*
*Response required

3.12 Project Information - Size of Project*
*Response required

3.13 Project Information - Cost of Project*
*Response required

4 REFERENCE # 2

4.1 Reference Contact Information - Name of Firm, City, County or Agency*
*Response required

4.2 Reference Contact Information - Reference's Business Address*
*Response required

4.3 Reference Contact Information - Reference's Contact Name & Title*
*Response required

4.4 Reference Contact Information - Reference's E-mail Address*
*Response required

4.5 Reference Contact Information - Reference's Phone Number*
*Response required

4.6 Project Information - Was your firm the prime contractor for the listed project?*

☐ Yes

☐ No

*Response required

4.7 Project Information - Name of Contactor Performing the Work*
*Response required

4.8 Project Information - Name and location of the project*
*Response required

4.9 Project Information - Nature of the firm's responsibility on the project and work for which staff was responsible for*
*Response required

4.10 Project Information - Project Duration*
*Response required

4.11 Project Information - Completion (Anticipated) Date*
*Response required

4.12 Project Information - Size of Project*
*Response required

4.13 Project Information - Cost of Project*
*Response required

5 REFERENCE # 3

5.1 Reference Contact Information - Name of Firm, City, County or Agency*
*Response required

5.2 Reference Contact Information - Reference's Business Address*
*Response required

5.3 Reference Contact Information - Reference's Contact Name & Title*
*Response required

5.4 Reference Contact Information - Reference's E-mail Address*
*Response required

5.5 Reference Contact Information - Reference's Phone Number*
*Response required

5.6 Project Information - Was your firm the prime contractor for the listed project?*

☐ Yes

☐ No

*Response required

5.7 Project Information - Name of Contactor Performing the Work*
*Response required

5.8 Project Information - Name and location of the project*
*Response required

5.9 Project Information - Nature of the firm's responsibility on the project and work for which staff was responsible for*
*Response required

5.10 Project Information - Project Duration*
*Response required

5.11 Project Information - Completion (Anticipated) Date*
*Response required

5.12 Project Information - Size of Project*
*Response required

5.13 Project Information - Cost of Project*
*Response required

6 REFERENCE # 4

6.1 Reference Contact Information - Name of Firm, City, County or Agency
6.2 Reference Contact Information - Reference's Business Address
6.3 Reference Contact Information - Reference's Contact Name & Title
6.4 Reference Contact Information - Reference's E-mail Address
6.5 Reference Contact Information - Reference's Phone Number
6.6 Project Information - Was your firm the prime contractor for the listed project?
☐ Yes
☐ No

6.7 Project Information - Name of Contactor Performing the Work
6.8 Project Information - Name and location of the project
6.9 Project Information - Nature of the firm's responsibility on the project and work for which staff was responsible for
6.10 Project Information - Project Duration
6.11 Project Information - Completion (Anticipated) Date
6.12 Project Information - Size of Project
6.13 Project Information - Cost of Project

7 REFERENCE # 5

7.1 Reference Contact Information - Name of Firm, City, County or Agency
7.2 Reference Contact Information - Reference's Business Address
7.3 Reference Contact Information - Reference's Contact Name & Title
7.4 Reference Contact Information - Reference's E-mail Address
7.5 Reference Contact Information - Reference's Phone Number
7.6 Project Information - Was your firm the prime contractor for the listed project?

☐ Yes
☐ No

7.7 Project Information - Name of Contactor Performing the Work
7.8 Project Information - Name and location of the project
7.9 Project Information - Nature of the firm's responsibility on the project and work for which staff was responsible for
7.10 Project Information - Project Duration
7.11 Project Information - Completion (Anticipated) Date
7.12 Project Information - Size of Project
7.13 Project Information - Cost of Project

8 PROJECT DOCUMENTS

8.1 PROPOSERS BACKGROUND INFORMATION FORM*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Proposers_Background_Inform...

*Response required

8.2 PROPOSAL SECURITY (BID BOND FORM OR CASHIER'S CHECK)

a. **In the event that your total cumulative base proposal amount exceeds $200,000,** a Proposal Security shall be in an amount not less than of 5% of the total cumulative base amount proposed.

b. Therefore, proposal should be accompanied by a certified or cashier’s check or by a Bid Bond made payable to the City of Pembroke Pines on an approved form, duly executed by the Proposer as principal and having as surety thereon a surety company acceptable to CITY and authorized to write such Bond under the laws of the State of Florida.

c. Contingency is not to be counted in the total amount the proposal security is based on.

d. Proposers must submit a scanned copy of their bid security (bid bond form or cashier's check) with their bid submittal through OpenGov.

e. Proposers should also submit their original bid security (bid bond form or cashier’s check) at time of the bid due date, or they may be deemed as non-responsive.

f. The original Bid Bond or Cashier's Check should be in a sealed envelope, plainly marked "**BID SECURITY - PSUT-25-13 Master Lift Station No. 4 (MLS4) Pump, Motor and Control Panel Replacement** and sent to the City of Pembroke Pines, City Clerk's Office, 4th Floor, 601 City Center Way, Pembroke Pines, Florida, 33025.

g. Please see SPECIAL TERMS & CONDITIONS of this document for additional information.

9 SWORN STATEMENT ON PUBLIC ENTITY CRIMES UNDER FLORIDA STATUTES CHAPTER 287.133(3)(a)

9.1 SWORN STATEMENT ON PUBLIC ENTITY CRIMES FORM*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Sworn_Statement_on_Public_E...

*Response required

9.2 Public Entity Crimes Status*

- Which option did you select on the Sworn Statement on Public Entity Crimes Form:

  - A) Neither the entity submitting this sworn statement, nor any 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.

  - B1) 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 the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND There has been a 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 did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

  - B2) 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 the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hear¬ings. The final order entered by the hearing

officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

- B3) 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 the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

☐ A) No convictions.
☐ B1) Convicted, final order did not place on the convicted vendor list.
☐ B2) Convicted, listed, then removed.
☐ B3) Convicted, not listed, action pending.
*Response required

9.3 Did you select option B1 or B2 above?*
☐ Yes
☐ No

*Response required

When equals "Yes"

9.3.1 Please upload a copy of the final order issued by the hearing officer of the State of Florida, Division of Administrative Hearings.*
*Response required

9.4 Did you select option B3 above?*
☐ Yes
☐ No

*Response required

When equals "Yes"

9.4.1 Please describe any action taken by or pending with the Department of General Services.*
*Response required

10 EQUAL BENEFITS CERTIFICATION FOR DOMESTIC PARTNERS AND ALL MARRIED COUPLES

10.1 EQUAL BENEFITS CERTIFICATION FORM*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Equal_Benefits_Certificatio...

*Response required

10.2 Equal Benefits Status*

- Which option did you select on the Equal Benefits Certification Form:
  - A. Contractor currently complies with the requirements of this section; or
  - B. Contractor will comply with the conditions of this section at the time of contract award; or
  - C. Contractor will not comply with the conditions of this section at the time of contract award: or
  - D. Contractor does not comply with the conditions of this section because of the following allowable exemption (Check only one box below):
    - 1. The Contractor does not provide benefits to employees' spouses in traditional marriages;
    - 2. The Contractor provides an employee the cash equivalent of benefits because the Contractor is unable to provide benefits to employees' Domestic Partners or spouses despite making reasonable efforts to provide them. To meet this exception, the Contractor shall provide a notarized affidavit that it has made reasonable efforts to provide such benefits. The affidavit shall state the efforts taken to provide such benefits and the amount of the cash equivalent. Cash equivalent means the amount of money paid to an employee with a Domestic Partner or spouse rather than providing benefits to the employee's Domestic Partner or spouse. The cash equivalent is equal to the employer's direct expense of providing benefits to an employee's spouse;
    - 3. The Contractor is a religious organization, association, society, or any non-profit charitable or educational institution or organization operated supervised or controlled by or in conjunction with a religious organization, association, or society;
    - 4. The Contractor is a governmental agency;

☐ A) Contractor currently complies.
☐ B) Will comply by contract award.
☐ C) Will not comply.
☐ D1) Does not comply due to an exemption: No spousal benefits for anyone.
☐ D2) Does not comply due to an exemption: Provides cash equivalent after trying.

☐ D3) Does not comply due to an exemption: Religious or related nonprofit.

☐ D4) Does not comply due to an exemption: Government agency.

*Response required

10.3 Did you select option D2 above?*

☐ Yes

☐ No

*Response required

When equals "Yes"

10.3.1 Please upload a notarized affidavit detailing the reasonable efforts made to provide benefits to employees' Domestic Partners or spouses, along with the amount of the cash equivalent provided.*

*Response required

11 DRUG-FREE WORKPLACE CERTIFICATION

11.1 VENDOR DRUG FREE WORKPLACE CERTIFICATION FORM*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Vendor_Drug-Free_Workplace_...

*Response required

11.2 Drug-Free Status*

☐ Complies fully.

☐ Does not comply.

*Response required

12 STANDARD DOCUMENTS

The following documents are standard documents that the City generally requires for every solicitation. As a result, we recommend vendors to keep these documents updated and readily available so that they can be easily uploaded for each project that the vendor would like to participate in. In the event that the City does not have one of the forms or documents listed below for your company, the City may reach out to your company after the bid has closed to obtain the document(s).

12.1 NON-COLLUSIVE AFFIDAVIT*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Non-Collusive_Affidavit.pdf

*Response required

12.2 SCRUTINIZED COMPANY CERTIFICATION*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Scrutinized_Company_Certifi...

*Response required

12.3 E-VERIFY SYSTEM CERTIFICATION*

a. Please download the attached document, complete all required fields, and upload the completed form here.

b. Effective January 1, 2021, pursuant to Section 448.095. Florida Statues, the City may not enter into a contract with a vendor/contractor/subcontractor unless that vendor/contractor/subcontractor is registered with and uses the E- Verify system administered by the U.S. Department of Homeland Security ("DHS").

c. Contractor shall also require all subcontractors to provide an affidavit attesting that the subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. The Contractor shall maintain a copy of such affidavit for the duration of the contract.

- E-Verify_System_Certificati...

*Response required

12.4 HUMAN TRAFFICKING AFFIDAVIT*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Human_Trafficking_Affidavit...

*Response required

13 VENDOR REGISTRATION

13.1 Do you currently have a City of Pembroke Pines Vendor Number registered in the PaymentWorks System?*

- The City of Pembroke Pines utilizes OpenGov as its e-Procurement platform for solicitation and bid submission purposes. However, please be advised that **vendor registration for onboarding and processing payments is handled separately** through the City's Accounts Payable Division using **PaymentWorks**, a secure online vendor management platform.

- All vendors that will be submitting invoices and requiring payments from the City are required to register on the PaymentWorks platform. If the vendor is not currently

registered with the City via PaymentWorks and does not have a Vendor Number, the City will have to invite the vendor to register.

- For formal solicitations such as this project, the Procurement Department will send PaymentWorks registration invitations to vendor(s) who are under active consideration for award. Please be aware that not all vendors who submit proposals will receive an invitation, in order to manage system usage and avoid onboarding vendors who are unlikely to receive payments from the City.
- Invitations will typically be sent to the contact listed on the submitted Vendor Information Form.

☐ Yes
☐ No

*Response required

When equals "Yes"

13.1.1 What is your Vendor Number?*
*Response required

13.2 VENDOR INFORMATION FORM*

a. Please download the attached document, complete all required fields, and upload the completed form here.

- Vendor_Information_Form.pdf

*Response required

13.3 FORM W-9 (REVISED MARCH 2024)*

a. Please download the attached document, complete all required fields, and upload the completed form here.

b. Note - Please use the March 2024 version of the form as previously dated versions of this form may delay the processing of any payments to the selected vendor.

- Form_W-9_(Rev_March_2024).pdf

*Response required

14 OPTIONAL DOCUMENTATION

14.1 TRADE SECRETS

a. The Proposer's response to this solicitation is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters or other material submitted in

connection with this solicitation and the Contract to be executed for this solicitation, subject to the provisions of Chapter 119.07 of the Florida Statutes.

b. Any language contained in the Proposer's response to the solicitation purporting to require confidentiality of any portion of the Proposer's response to the solicitation, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Proposer submits any documents or other information to the City which the Proposer claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Proposer shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Proposer must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Proposer's response to the solicitation constitutes a Trade Secret.

c. EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE SOLICITATION AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE SOLICITATION OR ANY PART THEREOF AS COPYRIGHTED. ALL DOCUMENTS THAT THE FIRM PURPORTS TO BE CONFIDENTIAL, PROPRIETARY OR A TRADE SECRET SHALL BE UPLOADED TO THE OPENGOV WEBSITE AS A SEPARATE ATTACHMENT, IN THIS SECTION, CLEARLY IDENTIFYING THE EXEMPTION BEING CLAIMED UNDER FLORIDA STATUTES 119.07.

d. The city's determination of whether an exemption applies shall be final, and the proposer agrees to defend, indemnify, and hold harmless the city and the city's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the city's treatment of records as public records.

14.2 FINANCIAL STATEMENTS

a. The City is **NOT** requesting the vendor to submit any financial statements for this project and prefers if the vendor does not submit financial statements. In addition, if the City needs a copy of the vendor's financial statements, the City can contact the vendor after the bid due date to request those documents. However, if the vendor does submit the financial statements, they should be uploaded in this section.

b. Any claim of confidentiality on financial statements must be asserted at the time of submittal. The firm must identify the specific statute that authorizes the exemption from the Public Records Law. Please note that the financial statement exemption

provided for in Section 119.071(1)c, Florida Statutes only applies to submittals in response to a solicitation for a "public works" project.

14.3 ALTERNATIVES

a. If you are submitting an alternative product, please upload any related information in this section (such as specification sheets, etc.).

b. In addition, pursuant to the **"Brand Names"** Section included in the GENERAL TERMS AND CONDITIONS Section if and wherever in the specifications a brand name, make, name of manufacturer, trade name, or vendor catalog number is mentioned, it is for the purpose of establishing a grade or quality of material only. Since the City does not wish to rule out other competition and equal brands or makes, the phrase "OR EQUAL" is added. However, if a product other than that specified is bid, Proposers shall indicate on their proposal and clearly state the proposed substitution and deviation. It is the vendor's responsibility to provide any necessary documentation and samples within their bid submittal to prove that the product is equal to that specified. Such samples are to be furnished before the date of bid opening, unless otherwise specified. Additional evidence in the form of documentation and samples may be requested if the proposed brand is other than that specified. The City retains the right to determine if the proposed brand shall be considered as an approved equivalent or not.

14.4 ADDITIONAL INFORMATION

a. Please provide any additional information that you deem necessary to complete your proposal in this section, if it has not been requested in another section.

14.5 PROFESSIONAL LICENSES

a. If applicable, please upload any professional licenses that may be required to perform the services outlined in the solicitation. The following licensing requirements shall apply when the applicable Florida statute mandates specific licensing for Contractors engaged in the type of work covered by this solicitation.

1. State of Florida, Department of Professional Regulation, Construction Industries Licensing Board and licensed by other federal, state, regional, county or municipal agencies having jurisdiction over the specified construction work.

2. Said licenses shall be in the Firm's name as it appears on the OpenGov registration and as appropriately registered with the applicable licensing entity. Proposer shall supply appropriate license numbers, with expiration dates, as part of their bid. Failure to hold and provide proof of proper licensing, certification and registration may be grounds for rejection of the bid.

3. Subcontractors contracted by the Prime Contractor shall be licensed in their respective fields to obtain construction permits as necessary. Said licenses must be in the name of the subcontractor.

15 VENDOR CLASSIFICATION

15.1 Is your firm a Local Pembroke Pines Vendor (LPPV) and Local Broward County Vendor (LBCV)?*

a. The evaluation of competitive bids is subject to section 35.36 of the City's Procurement Procedures which, except where contrary to federal and state law, or any other funding source requirements, provides that preference be given to local businesses. To satisfy this requirement, the vendor shall affirm in writing its compliance with either of the following objective criteria as of the bid or proposal submission date stated in the solicitation. A local business shall be defined as:

1. **"Local Pembroke Pines Vendor"** shall mean a business entity which has maintained a permanent place of business with full-time employees within the City limits for a minimum of one (1) year prior to the date of issuance of a bid or proposal solicitation. The permanent place of business may not be a post office box. The business location must actually distribute goods or services from that location. In addition, the business must have a current business tax receipt from the City of Pembroke Pines, **OR;**

2. **"Local Broward County Vendor"** shall mean or business entity which has maintained a permanent place of business with full-time employees within the Broward County limits for a minimum of one (1) year prior to the date of issuance of a bid or proposal solicitation. The permanent place of business may not be a post office box. The business location must actually distribute goods or services from that location. In addition, the business must have a current business tax receipt from the Broward County or the city within Broward County where the business resides.

b. A preference of five percent (5%) of the total evaluation point, or five percent (5%) of the total price, shall be given to the Local Pembroke Pines Vendor(s); A preference of two and a half percent (2.5%) of the total evaluation point for local, or two and a half percent (2.5%) of the total price, shall be given to the Local Broward County Vendor(s).

☐ Yes
☐ No

*Response required

When equals "Yes"

15.1.1 Please indicate your Local Vendor Status*

☐ Local Pembroke Pines Vendor (LPPV)

☐ Local Broward County Vendor (LBCV)

*Response required

When equals "Yes"

15.1.2 Local Vendor Preference Certification*

1. Please download the attached document, complete all required fields, and upload the completed form here.

- Local_Vendor_Preference_Cer...

*Response required

When equals "Yes"

15.1.3 Local Business Tax Receipts*

1. If claiming Local Vendor Preference, please upload any previous business tax receipts to indicate that the business entity has maintained a permanent place of business for a minimum of one (1) year.

*Response required

15.2 Is your firm a Veteran Owned Small Business (VOSB)?*

a. The evaluation of competitive bids is subject to section 35.37 of the City's Procurement Procedures which, except where contrary to federal and state law, or any other funding source requirements, provides that preference be given to veteran owned small businesses. To satisfy this requirement, the vendor shall affirm in writing its compliance with the following objective criteria as of the bid or proposal submission date stated in the solicitation.

b. A preference of two and a half percent (2.5%) of the total evaluation point, or two and a half percent (2.5%) of the total price, shall be given to the Veteran Owned Small Business (VOSB).

☐ Yes

☐ No

*Response required

When equals "Yes"

15.2.1 Upload the "Determination Letter" from the United States Department of Veteran Affairs Center notifying the business that they have been approved as a Veteran Owned Small Business (VOSB)

When equals "Yes"

15.2.2 Upload Veteran Owned Small Business Certification(s) from any relevant agency(ies)

15.3 Is your firm a Minority-Owned Business Enterprise (MBE)?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.3.1 Please indicate the classification of your Minority-Owned Business Enterprise (MBE)*

Select all that apply

☐ African-American MBE

☐ Asian-American MBE

☐ Hispanic-American MBE

☐ Native-American MBE

☐ Other option not listed above

*Response required

When equals "Yes"

15.3.2 MBE Certification Documentation*

1. Upload your MBE Certification Documentation here, preferably with the State of Florida's Office of Supplier Diversity. If you have multiple MBE certifications, please combine them into one (1) document and upload.

*Response required

15.4 Is your firm a Woman-Owned Business Enterprise (WBE)?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.4.1 WMBE Certification Documentation*

1. Upload your WMBE Certification Documentation here, preferably with the State of Florida's Office of Supplier Diversity. If you have multiple WMBE certifications, please combine them into one (1) document and upload.

*Response required

15.5 Is your firm a HubZone Business / Labor Surplus Area Firm?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.5.1 HubZone Business / Labor Surplus Area Firm Certification Documentation*

1. Upload your HubZone Business / Labor Surplus Area Firm Certification Documentation, preferably with the U.S. Small Business Administration (SBA). If you have multiple certifications, please combine them into one (1) document and upload.

*Response required

15.6 Is your firm a Broward County Small Business Enterprise (SBE)?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.6.1 SBE Cerification Documentation*

1. Upload your SBE Certification Documentation from Broward County's Office of Economic and Small Business Development (OESBD). If you have multiple certifications, please combine them into one (1) document and upload.

*Response required

15.7 Is your firm a Broward County Business Enterprise (CBE)?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.7.1 CBE Certification Documentation*

1. Upload your CBE Certification Documentation from Broward County's Office of Economic and Small Business Development (OESBD). If you have multiple certifications, please combine them into one (1) document and upload.

*Response required

15.8 Is your firm a Broward County Disadvantaged Business Enterprise (DBE)?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.8.1 DBE Certification Documentation*

1. Upload your DBE Certification Documentation from Broward County's Office of Economic and Small Business Development (OESBD). If you have multiple certifications, please combine them into one (1) document and upload.

*Response required

15.9 Does your firm have a Vendor Classification that was not listed above?*

☐ Yes

☐ No

*Response required

When equals "Yes"

15.9.1 Other Vendor Classification Certification Documentation*

1. Upload your other Certification Documentation here. If you have multiple certifications, please combine them into one (1) document and upload.

*Response required

SECTION 7 - EVALUATION OF PROPOSALS & PROCESS SELECTION

7.1 Qualifying & Selecting Firms

A. Staff will evaluate all responsive proposals received from proposers who meet or exceed the bid requirements contained in the solicitation. Evaluations shall be based upon the information and references contained in the proposals as submitted.

B. Staff will make a recommendation to the City Commission for award of contract.

C. The contract shall be awarded to the most responsive/responsible bidder whose bid is determined to be the most advantageous to the City taking into consideration the evaluation criteria.

DRAFT DOCUMENT FOR COMMISSION REVIEW

The City Of PEMBROKE PINES Florida

MASTER LIFT STATION NO. 4 (MLS4) PUMP, MOTOR AND CONTROL PANEL REPLACEMENT

(SE CORNER OF WASHINGTON ST AND SW 114 AVE)

VICINITY MAP - NOT TO SCALE

DRAWING INDEX

REVISIONS

NO.	DATE	BY	DESCRIPTION

CITY OF PEMBROKE PINES
UTILITIES DEPARTMENT
8300 SOUTH PALM DRIVE
PEMBROKE PINES, FL 33025

PEMBROKE PINES COMMISSION

ANGELO CASTILLO	MAYOR
MICHAEL A. HERNANDEZ	VICE MAYOR - DISTRICT 4
THOMAS GOOD Jr.	DISTRICT 1
JAY D. SCHWARTZ	DISTRICT 2
MARIA RODRIGUEZ	DISTRICT 3
CHARLES F. DODGE	CITY MANAGER

BID SET

DATE: OCTOBER 13, 2025

CAD FILE: COVER SHEET, C-0

PROJECT TITLE: MASTER LIFT STATION NO. 4 (MLS4) PUMPS AND CONTROL PANEL REPLACEMENT

C-0

PUMP DESIGN BASIS		
FLUID	RAW SEWAGE	
INSTALLATION LOCATION	MASTER LIFT STATION NO.4 (MLS4)	
PUMP TYPE	SUBMERSIBLE SOLIDS HANDLING	
OPERATING CONDITIONS		
CONDITION	FLOW, GPM	HEAD, FEET
SHUT-OFF	0	135
MINIMUM FLOW	680.9	117
DUTY POINT	2073	80
MINIMUM HEAD	2700	60
NPSHr MAX = 32 FEET AT MINIMUM HEAD		
EFFICIENCY @ DUTY POINT = 80.72%		
PUMP SIZE 8"/6" INCH SUCTION/DISCHARGE		
MOTOR RATING 60 HP – 1780 RPM – INVERTER DUTY		
MOTOR RATED HP MAY NOT BE OVERLOADED AT ANY POINT IN THE PUMPS PERFORMANCE CURVE		
DESIGN BASE MANUFACTURER: FAIRBANKS-PENTAIR SUBSTITUTE MANUFACTURERS: APPROVED EQUAL		
PUMP SUBSTITUTE MAY NOT DEVIATE MORE THAT 10% FROM OPERATING CONDITIONS AND MUST MEET ALL SPECIFICATION REQUIREMENTS TO BE CONSIDERED EQUAL REFER TO SPECIFICATIONS FOR DETAILS.		

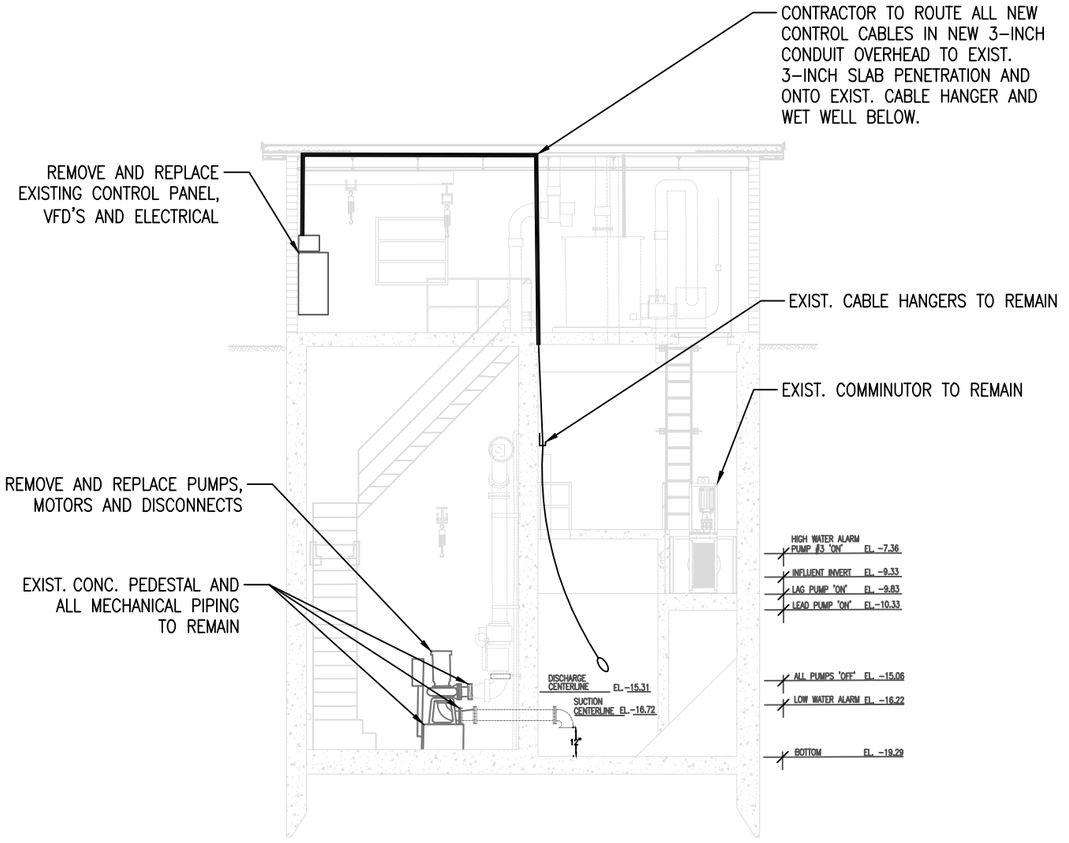
GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF PEMBROKE PINES UTILITY STANDARDS, HYDRAULIC INSTITUTE STANDARDS, FLORIDA BUILDING CODE AND OTHER CODES AND STANDARDS AS APPLICABLE.
2. DRY PIT SHALL BE IN ACCORDANCE WITH CLASS I, DIV. I, HAZARDOUS LOCATION REQUIREMENTS, PER NEC.
3. REMOVE AND SALVAGE EXIST. PUMPS, POWER/CONTROL CABLES AS DIRECTED BY THE CITY. DISCARD ALL USED ELECTRICAL CONDUITS AND DEVICES.
4. ALL ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (N.A.V.D. 88).
5. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING AS REQUIRED.
6. THIS APPLICATION IS A SUBMERSIBLE PUMP IN A DRY PIT. THEREFORE, A COOLING JACKET IS REQUIRED.
   - 6.1. THE PUMP MANUFACTURER SHALL CERTIFY THAT THE PUMP AND MOTOR, EQUIPPED WITH THE MANUFACTURES COOLING JACKET, SHALL NOT OVERHEAT IN THE RANGE OF DUTY CONDITIONS IN THE DRY PIT.
   - 6.2. PRODUCT WATER COOLING WILL NOT BE ACCEPTED.
7. ALL HARDWARE (BRACKETS, FASTENERS, ETC.) SHALL BE 316 STAINLESS STEEL.
8. WHEN SETTING NEW PUMPS, CONTRACTOR SHALL MECHANICALLY REMOVE ALL MORTER, GROUT AND PAINT FROM THE PUMP PEDESTALS; INSTALL NEW LEVELING NUTS, WASHERS AND NON-SHRINK GROUT.
9. THE CONTRACTOR SHALL PERFORM SURFACE PREPARATION AND PAINT ALL NEW PUMPS, MOTORS, EXISTING SUCTION, DISCHARGE PIPING AND CONCRETE PEDESTALS.
10. THESE DRAWINGS ARE INTENDED TO BE SCHEMATIC. THE CONTRACTOR SHALL CONDUCT A SITE INSPECTION TO VERIFY ALL DIMENSIONS AND QUANTITIES PRIOR TO SUBMITTING THE BID.

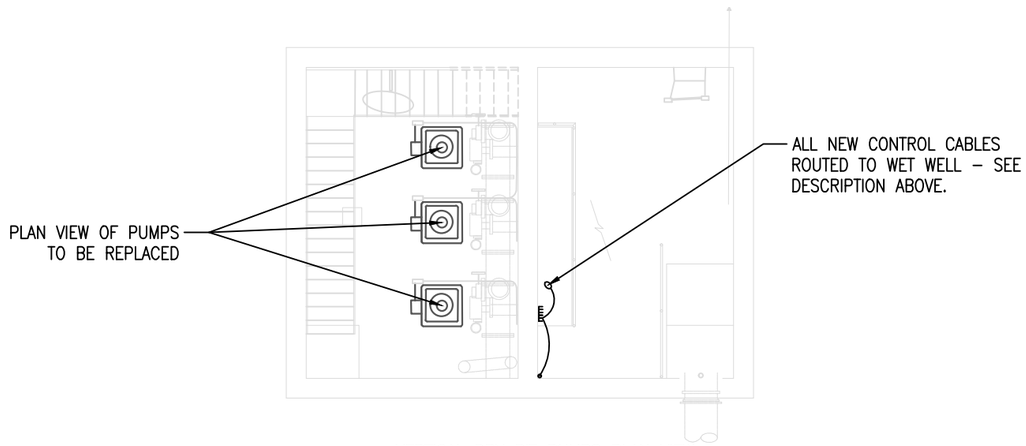
NOTE
TO ASSURE UNITY OF RESPONSIBILITY, THE PUMPS, MOTORS, CONTROL PANEL AND INTEGRATION SHALL BE FURNISHED BY THE PUMP MANUFACTURER AND COORDINATED BY THE LOCAL PUMP MANUFACTURERS REPRESENTATIVE. THE CONTRACTOR AND PUMP MANUFACTURER SHALL ASSUME FULL RESPONSIBILITY FOR THE SATISFACTORY INSTALLATION AND OPERATION OF THE ENTIRE PUMPING SYSTEM.

NOTE:
THE INTENT OF THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING PUMPS AND MOTORS WITH NEW PUMPS AND MOTORS WITHOUT THE REPLACEMENT OF MECHANICAL FITTINGS, VALVES OR MODIFICATION OF CONCRETE PEDESTALS.

PUMP SUBSTITUTIONS WHICH REQUIRE MODIFICATIONS TO MECHANICAL FITTINGS OR CONCRETE PEDESTALS MAY BE CONSIDERED. HOWEVER, SUCH MODIFICATIONS SHALL BE AT NO ADDITIONAL COST TO THE CITY.



EXIST. DRY PIT/WELL WELL PUMP STATION ELEVATION
NOT TO SCALE



VERTICAL DRY PIT PUMPS PLAN VIEW
NOT TO SCALE

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

SEAL

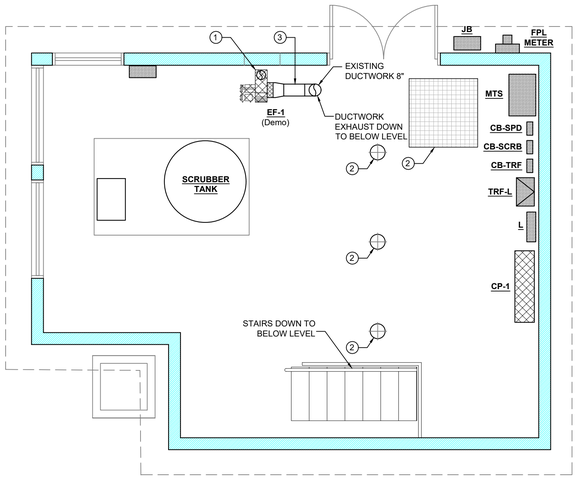
CITY OF PEMBROKE PINES
UTILITIES DEPARTMENT
8300 SOUTH PALM DRIVE
PEMBROKE PINES, FLORIDA 33025

REVISIONS			
NO	DATE	BY	DESCRIPTION

MASTER LIFT STATION No. 4 (MLS4)
PUMPS AND CONTROL PANEL REPLACEMENT

PUMP REPLACEMENT PLAN AND ELEVATION

SHEET NUMBER: P-1
SCALE: N.T.S.
SHEET: 1 OF 1
CITY OF P.P. PLAN SUBMITTAL: BID SET
SUBMITTAL DATE: OCTOBER 13, 2025

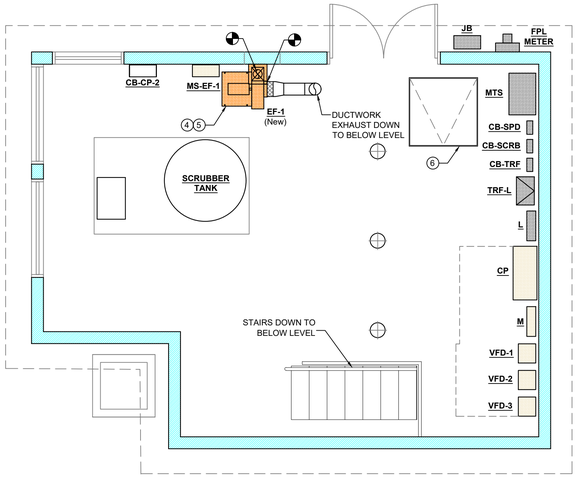


MECHANICAL PLAN ABOVE LEVEL DEMOLITION

SCALE: 1/4" = 1'-0"

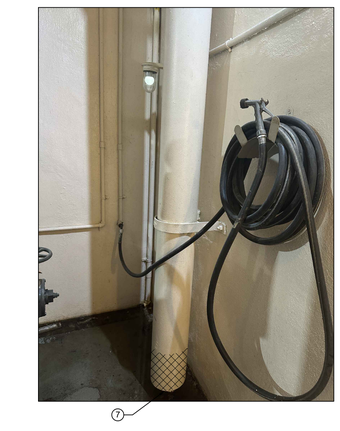
DETAIL 1 - ABOVE LEVEL

N.T.S.



MECHANICAL PLAN ABOVE LEVEL NEW

SCALE: 1/4" = 1'-0"



DETAIL 2 - BELOW LEVEL

N.T.S.

KEY MECHANICAL NOTES

1. EXISTING EXHAUST FAN TO BE REPLACED.
2. EXISTING OPENING FOR EQUIPMENT REMOVAL.
3. EXISITING 8" DUCTWORK TO REMAIN.
4. NEW EXHAUST FAN. MECHANICAL CONTRACTOR SHALL ADD NEW SUPPORT, EXTEND EXISTING EXHAUST FAN BASE TO ACCOMMODATE NEW EXHAUST FAN (IF REQUIRED) AND DISCONNECT EXISTING DUCTWORK FROM EXISTING EXHAUST FAN AND RECONNECT THE DUCTWORK TO NEW EXHAUST FAN.
5. THE EXHAUST FAN EF-1 WILL BE OPERATED FROM A NEW MOTOR STARTER INSTALLED NEXT TO IT. THE EXHAUST FAN WILL BE TURN OFF WITH A SIGNAL FROM THE CONTROL PANEL IF THE WATER SENSOR ON THE BELOW LEVEL IS ACTIVATED. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR.
6. ADD A NEW NEOPRENE MAT TO COVER THIS EXISTING OPENING (48" x 48"). THE NEOPRENE MAT SHALL BE REMOVABLE.
7. DUCTWORK TO BE TERMINATED AT 18" FROM BOTTOM OF THE SLAB.

APPLICABLE CODES

ST BUILDING CODE:	FLORIDA BUILDING CODE - 8TH EDITION - 2023
FIRE/LIFE SAFETY CODE:	FLORIDA FIRE PREVENTION CODE - 8TH EDITION - 2023
MECHANICAL CODE:	FLORIDA MECHANICAL CODE - 8TH EDITION - 2023
PLUMBING CODE:	FLORIDA PLUMBING CODE - 8TH EDITION - 2023
ENERGY CODE:	FLORIDA ENERGY CONSERVATION CODE - 8TH EDITION-2023
NFPA 70:	NATIONAL ELECTRICAL CODE - 2020 EDITION
NFPA 72:	NATIONAL FIRE ALARM CODE - 2019 EDITION
NFPA 101:	LIFE SAFETY CODE - 2021 EDITION

CODE REQUIREMENTS SHALL BE INCLUSIVE OF ALL ADDENDUMS AND CLARIFICATIONS ISSUED UP TO THE TIME WHEN THE BUILDING PERMIT IS GRANTED. THE LISTED CODES AND PERMIT STANDARDS SHALL NOT BE CONSTRUED TO BE THE ONLY APPLICABLE CODES AND STANDARDS GOVERNING THIS PROJECT. THE GENERAL CONTRACTOR, ALL SUB-CONTRACTORS AND SUPPLIERS SHALL VERIFY AND ADHERE TO THE REQUIREMENTS OF ALL OF THE CODES AND STANDARDS THAT GOVERN AND PERTAIN TO THEIR PRESCRIBED SCOPE OF WORK.

GENERAL MECHANICAL NOTES

1. DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW EVERY OFFSET AND/OR BEND IN THE DUCTWORK REQUIRED BY ACTUAL FIELD CONDITIONS AND COORDINATED INSTALLATION WITH OTHER TRADES. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE CONTRACTOR AT THE SITE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF INSTALLATION WITH OTHER TRADES TO AVOID CONFLICT.
3. DRAWINGS SHALL NOT BE SCALED. UNLESS SPECIFIC DIMENSIONS ARE SHOWN, SITE CONDITIONS SHALL GOVERN THE EXACT LOCATION OF MECHANICAL EQUIPMENT AND APPURTENANCES.
4. EXISTING SYSTEMS (PIPING, DUCTWORK, ETC.) SERVING AREAS NOT COVERED BY THIS CONTRACT BUT IN SERVICE AT THE TIME OF CONSTRUCTION, SHALL NOT BE INTERRUPTED UNLESS IT IS A TEMPORARY INTERRUPTION COORDINATED WITH THE CITY OF PEMBROKE PINES PROJECT MANAGER.
5. ALL WORK SHALL BE PERFORMED IN A CLEAN MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
6. CONTRACTOR MUST FIELD VERIFY FINAL LOCATIONS, HEIGHTS, CONNECTION SIZES AND POSITIONS OF ALL REQUIRED EQUIPMENT CONNECTIONS AND OF WALL PENETRATIONS.
7. PROVIDE AND INSTALL NECESSARY TRANSITIONS AND DUCTWORK INCREASER/REDUCERS AS REQUIRED FOR EQUIPMENT CONNECTIONS. CONSULT MANUFACTURER'S DATA FOR ACTUAL CONNECTION SIZES, INCLUDING, BUT NOT LIMITED TO THOSE SHOWN.
8. PROVIDE EQUIPMENT ACCESS AND CLEARANCES REQUIRED FOR SERVICING AS PER FLORIDA MECHANICAL CODE 2023 AND AS PER MANUFACTURER'S RECOMMENDATIONS.
9. ALL EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATORS AND INSTALLED AS RECOMMENDED BY EQUIPMENT MANUFACTURER.
10. ALL DUCTWORK MUST BE INSTALLED IN ACCORDANCE WITH THE FLORIDA MECHANICAL CODE 2023 AND MUST BE PROPERLY ASSEMBLED, SUPPORTED, ISOLATED AND INSULATED AS INDICATED.
11. SEAL ALL PENETRATIONS CREATED FOR DUCTWORK IN WALLS, FIRE STOP AND WEATHER TIGHT AS REQUIRED.
12. ALL EQUIPMENT MOUNTED OUTDOORS SHALL BE INSTALLED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 2023 EDITION.
13. FIELD VERIFY WITH ELECTRICAL FOR COORDINATION WITH THESE DRAWINGS.

FAN SCHEDULE

FAN No.	QTY.	SERVICE	CFM	EST. ESP IN. WG.	MOTOR HP	V / PH / Hz	DRIVE	FAN TYPE	WEIGHT	DESIGN BASED ON		OPTIONS & ACCESORIES
										MAKE	MODEL No.	
EF-1	1	DRY WELL LEVEL BELOW	1,000	1.3"	3/4	208 / 3 / 60	DIRECT	CENTRIFUGAL FRP FAN	219 LBS.	GREENHECK	10-BCSW-FRP-4-I-7	SEE BELOW

ACCESORIES & OPTIONS:

- A - TEFC MOTOR
- B - DIRECT MOUNT RUBBER ISOLATORS
- C - BOLTED ACCESS DOOR
- D - INLET CONNECTION - INLET COLLAR, SLIP FIT
- E - OUTLET CONNECTION - INTEGRAL TO ROUND WITH SLIP FIT
- F - UL LISTED
- G - PROTECTION COATING
- H - CORROSIVE RESISTANT SPARK-PROOF FAN

CONSTRUCTION NOTES:

- A - FIBERGLASS WHEEL AND INLET CONE
- B - FIBERGLASS REINFORCED PLASTIC SCROLL
- C - UPBLAST DISCHARGE POSITION
- D - TEFC MOTOR
- E - ALL HARDWARE IN CONTACT WITH AIRSTREAM TO BE STAINLESS STEEL AND ENCAPSULATED IN RFP

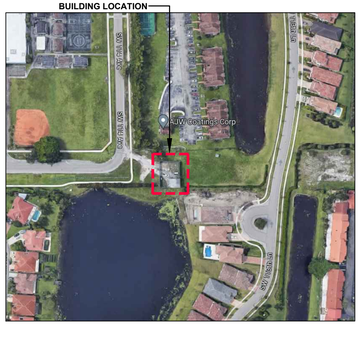
NOTES:

1. VERIFY ELECTRICAL CHARACTERISTICS BEFORE ORDERING ANY EQUIPMENT.
2. ALL ACCESSORIES MUST BE PROVIDED BY MECHANICAL CONTRACTOR.
3. ALL FANS MUST BE INSTALLED IN ACCORDANCE WITH THE FLORIDA MECHANICAL CODE - 2023.

COORDINATION NOTES:

1. COORDINATE ALL WORK TO BE DONE WITH CITY OF PEMBROKE PINES PROJECT MANAGER .

BUILDING LOCATION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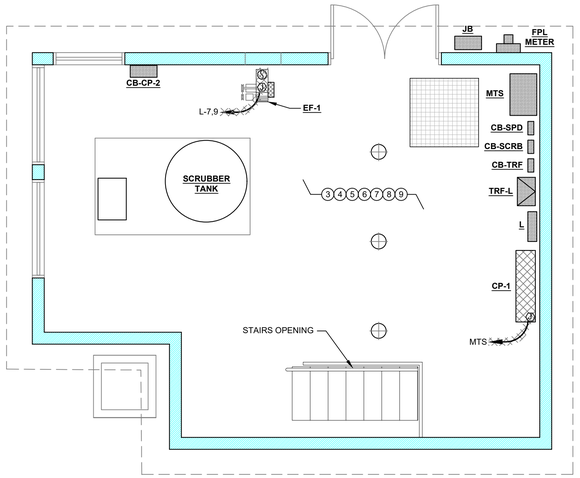
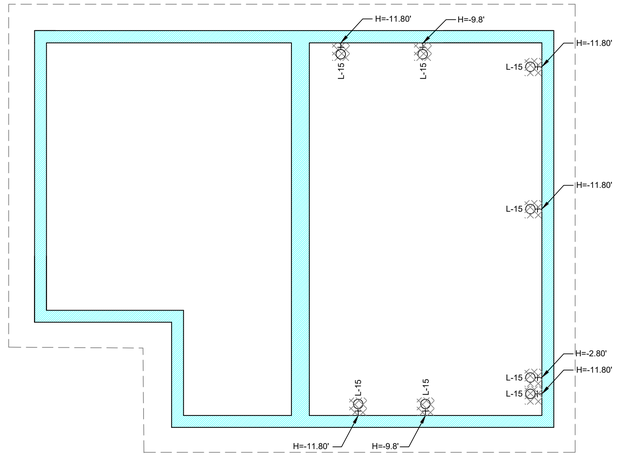


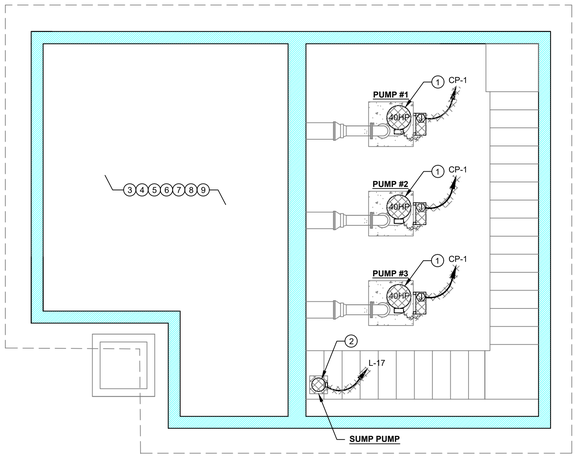
ELECTRICAL PLAN ABOVE LEVEL - DEMOLITION

SCALE: 1/4" = 1'-0"



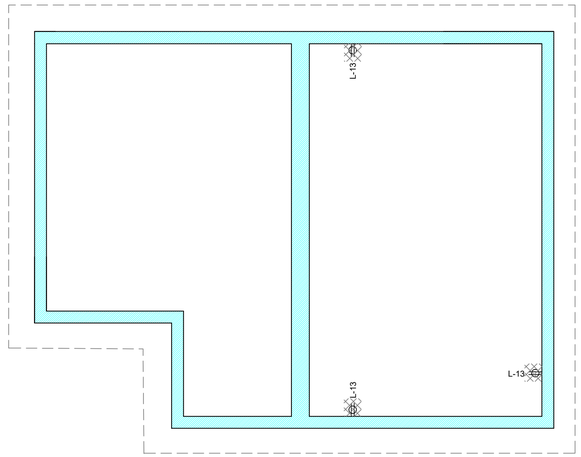
ELECTRICAL PLAN BELOW LEVEL - LIGHTS DEMOLITION

SCALE: 1/4" = 1'-0"



ELECTRICAL PLAN BELOW LEVEL - DEMOLITION

SCALE: 1/4" = 1'-0"



ELECTRICAL PLAN BELOW LEVEL - RECEPTACLES DEMOLITION

SCALE: 1/4" = 1'-0"

SCOPE OF WORK

- REPLACEMENT OF EXISTING THREE (3) 40HP, 480V-3PH ELECTRICAL PUMPS WITH THREE (3) NEW 60HP, 480V-3PH ELECTRICAL PUMPS.
- REPLACEMENT OF EXISTING ELECTRICAL SUMP PUMP WITH NEW ELECTRICAL WITH A SUMP PUMP LIBERTY, XFL55M-2 - ½ HP EXPLOSION PROOF EFFLUENT PUMP, CLASS I DIVISION 1, SUITABLE FOR FLOOR SUMP APPLICATIONS (OR EQUIVALENT).
- REPLACEMENT OF EXISTING ELECTRICAL EXHAUST FAN WITH A NEW 3/4HP 208V-3PH ELECTRICAL EXHAUST FAN AND A MOTOR STARTER SQUARE-D KIT LC1D09 + LR9D OVERLOAD RELAY + PUSH BUTTON STATION (START / STOP) WITH HAND-OFF-AUTO SELECTOR FOR 1/2 HP MOTOR CONTROL (OR EQUIVALENT).
- REPLACEMENT OF DOWNSTAIRS LIGHTS AND RECEPTACLES WITH CLASS 1, DIVISION 1, EXPLOSION PROOF LIGHTS AND RECEPTACLES.
- DEMOLITION OF THE EXISTING CONTROL PANEL (CP-1).
- DEMOLITION OF THREE 100A EXISTING UN-FUSE DISCONNECT SWITCHES.
- INSTALLATION OF NEW 300A, 277/480V ELECTRICAL PANEL (M).
- INSTALLATION OF THREE (3) NEW 60HP, 480V-3PH VARIABLE FREQUENCY DRIVES (VFDs) FOR THREE NEW ELECTRICAL PUMPS OF 60 HP.
- INSTALLATION OF THREE (3) NEW 60HP, 480V-3PH UN-FUSE DISCONNECT SWITCHES, CLASS 1, DIVISION 1 FOR THE THREE NEW ELECTRICAL PUMPS OF 60 HP. REFERENCE SQUARE-D, H225XJG (OR EQUIVALENT).

ELECTRICAL SYMBOLS

P-XX	BRANCH CIRCUIT HOMERUN TO PANEL BOARD NUMBER INDICATE CIRCUIT DESIGNATION
	ELECTRICAL PANEL
3 100 0	ELECTRICAL DISCONNECT SWITCH 3- NUMBER OF POLES, 100-FRAME SIZE, 0 - FUSE SIZE
	JUNTION BOX IN EQUIPMENT
	DUPLEX RECEPTACLE OUTLET, 120 VOLTS, 3-WIRE, GROUNDING TYPE, 20 AMPS. CLASSIFIED AREA CL1, DV 1, INSTALL 18"A.F.F. UNLESS OTHERWISE NOTED.
	WALL MOUNTED LIGHT FIXTURE, 120V, 300 WATTS MAX. CLASSIFIED AREA CL1, DV 1.
	WALL MOUNTED LIGHT FIXTURE, 120V, 40 WATTS MAX.

ELECTRICAL KEY NOTES

1. EXISTING 40HP, 480V-3PH, ELECTRICAL PUMP TO BE REPLACED.
2. EXISTING ELECTRICAL SUMP PUMP TO BE REPLACED.
3. ALL WORK SHALL BE COORDINATED WITH CITY OF PEMBROKE PINES PROJECT MANAGER BEFORE EXECUTION.
4. ELECTRICAL CONTRACTOR SHALL EXERCISE EXTRA CARE FOR ALL DEMOLITION WORK. COORDINATE WITH CITY OF PEMBROKE PINES PROJECT MANAGER WHERE THE REMOVED EQUIPMENT SHALL BE PLACED.
5. ALL WORK SHALL BE PERFORMED IN A CLEAN MANNER. ALL WORK SHALL BE COORDINATED WITH CITY OF PEMBROKE PINES PROJECT MANAGER TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
6. ALL REMOVED ITEMS SHALL BECOME PROPERTY OF THE CITY OF PEMBROKE PINES AND SHALL BE DISPOSED AS PER CITY OF PEMBROKE PINES MANAGER INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH WILL NOT BE KEPT BY THE OWNER, SHALL BE REMOVED FROM THE BUILDING AT CONTRACTOR'S EXPENSE.
7. THESE DRAWINGS ARE DIAGRAMMATICAL IN NATURE AND REPRESENT EXISTING CONDITIONS BASED ON AVAILABLE DRAWINGS AND SITE OBSERVATIONS. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL ACTUAL CONDITIONS, FOR EXACT LOCATIONS AND SIZES OF PIPING, CONDUIT, WIRES, EQUIPMENT, ETC.
8. EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WORK DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO MATCH EXISTING WORK.
9. EXISTING CONDUIT AND WIRE TO BE REUSED. ELECTRICAL CONTRACTOR SHALL EXTEND AND RECONNECT EXISTING WIRE AS REQUIRED IF THEY ARE IN GOOD CONDITION AND MATCH NEW REQUIREMENTS.

ELECTRICAL NOTES

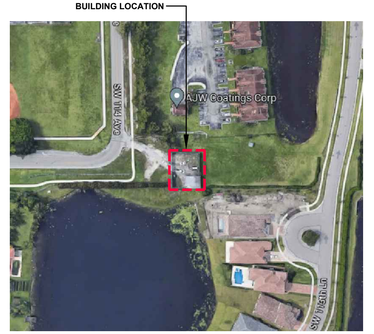
1. CONTRACTOR SHALL GUARANTEE THE ENTIRE ELECTRICAL WORK, INCLUDING PARTS AND LABOR, FOR A PERIOD OF ONE (1) YEAR AFTER FINAL WRITTEN ACCEPTANCE BY CITY OF PEMBROKE PINES.
2. THE CONTRACTOR SHALL TAKE PERMITS AND PROCURE CERTIFICATES.
3. THE CONTRACTOR SHALL MAKE FIELD VISITS PRIOR TO BID AND BECOME FAMILIAR WITH THE SCOPE OF WORK INVOLVED IN THIS JOB. EXTRAS SHALL NOT BE ALLOWED FOR FAILURE ON THE CONTRACTOR'S PART TO COMPLY WITH THIS REQUIREMENT.
4. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES AS WELL PROVIDING TEMPORARY POWER AT PROJECT SITE FOR ALL TRADES. THE OWNER SHALL BE RESPONSIBLE FOR ALL FEES NECESSARY TO BRING UTILITY POWER TO PROJECT SITE.
5. ALL MATERIALS SHALL BE NEW, OF TYPES AND MAKES CALLED FOR, OR APPROVED EQUAL.
6. GROUNDING SHALL COMPLY WITH THE NEC ART 250.
7. PROVIDE ENGRAVED PLASTIC LABELS FOR ALL NEW ELECTRICAL PANELS AND JUNCTION BOXES.
8. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO OWNER'S REPRESENTATIVE FOR EXPEDITING AND RESOLUTION.
9. CONTRACTOR TO ASSURE THAT PROPER CLEARANCE (AS PER MANUFACTURER RECOMMENDATIONS) IS PROVIDED AROUND ALL NEW EQUIPMENT FOR SERVICING AND REPLACEMENT PURPOSES.
10. DISCONNECT SWITCHES SHALL BE H.P. RATED, QUICK-MAKEQUICK-BREAK ENCLOSURES AS REQUIRED BY EXPOSURE.
11. ALL WIRING INSTALLATION SHALL BE MADE AS REQUIRED BY NEC ART. 300.
12. ALL CONDUCTORS SHALL BE COPPER WITH THW/THWN INSULATION. ALL CONDUCTORS #10 AND SMALLER MAY BE SOLID. ALL CONDUCTORS #8 AND LARGER SHALL BE STRANDED TYPE. ALL CONDUCTORS SHALL BE IN CONDUIT. CONDUITS SHALL BE STAINLESS STEEL SS-316. ALL WIRING INSTALLATION SHALL BE MADE AS REQUIRED BY NEC Art. 300.

APPLICABLE CODES

BUILDING CODE:	FLORIDA BUILDING CODE - 8TH EDITION - 2023
FIRE/LIFE SAFETY CODE:	FLORIDA FIRE PREVENTION CODE - 8TH EDITION - 2023
MECHANICAL CODE:	FLORIDA MECHANICAL CODE - 8TH EDITION - 2023
ENERGY CODE:	FLORIDA ENERGY CONSERVATION CODE - 8TH EDITION-2023
NFPA 70:	NATIONAL ELECTRICAL CODE - 2020 EDITION
NFPA 72:	NATIONAL FIRE ALARM CODE - 2019 EDITION
NFPA 101:	LIFE SAFETY CODE - 2021 EDITION

CODE REQUIREMENTS SHALL BE INCLUSIVE OF ALL ADDENDUMS AND CLARIFICATIONS ISSUED UP TO THE TIME WHEN THE BUILDING PERMIT IS GRANTED. THE LISTED CODES AND PERMIT STANDARDS SHALL NOT BE CONSTRUED TO BE THE ONLY APPLICABLE CODES AND STANDARDS GOVERNING THIS PROJECT. THE GENERAL CONTRACTOR, ALL SUB-CONTRACTORS AND SUPPLIERS SHALL VERIFY AND ADHERE TO THE REQUIREMENTS OF ALL OF THE CODES AND STANDARDS THAT GOVERN AND PERTAIN TO THEIR PRESCRIBED SCOPE OF WORK.

BUILDING LOCATION



LOCATION MAP

N.T.S.

INGEMEL S.A.
ENGINEERING COMPANY
State of Florida CA No. 9113
20871 Johnson Street, Suite 115
Phone: (954) 318-2264 Fax: (954) 450-7216
Pembroke Pines, Florida 33029

The City Of PEMBROKE PINES

LEGENDS:

EXISTING

DEMOLITION

P.E. SEAL

TO THE BEST OF OUR KNOWLEDGE THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODE

Pedro Arias, P.E.
Florida Registration. No. 63813

REV No.	DATE	DESCRIPTION
-	10-13-25	ISSUED FOR BID

PROJECT:

MASTER LIFT STATION #4 PUMPS ADDITION

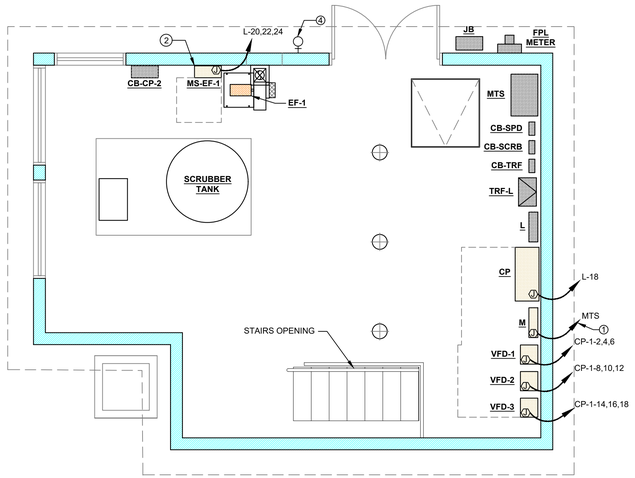
PROJECT ADDRESS:
SW 114 Ave -Washington St.
PEMBROKE PINES, FL 33024

CONTENTS:
ELECTRICAL ABOVE PLAN - DEMOLITION
ELECTRICAL BELOW PLAN - DEMOLITION

SCALE :INDICATED	DATE:05-20-24
DRAWN:J.MEDINA	DWG FILE:23-108E1
APPROVED:P.ARIAS	PROJECT NO.:23-108

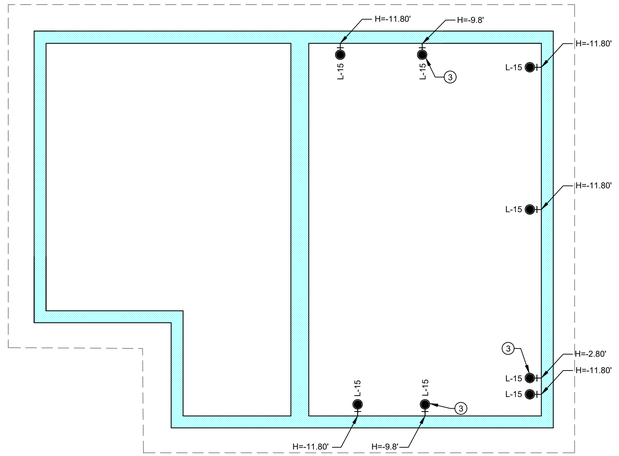
SHEET No.:
E - 1

SHEET:	OF:
1	5



ELECTRICAL PLAN ABOVE LEVEL - NEW

SCALE: 1/4" = 1'-0"

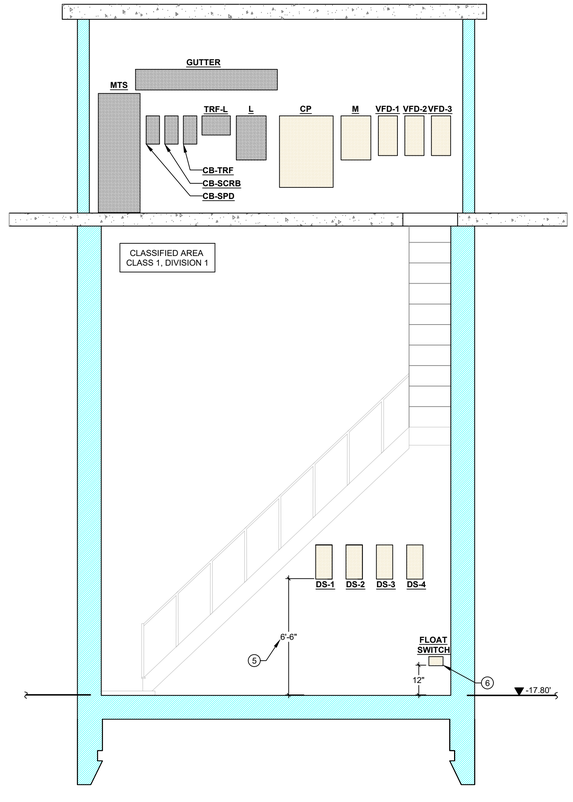


ELECTRICAL PLAN BELOW LEVEL - LIGHTS - NEW

SCALE: 1/4" = 1'-0"

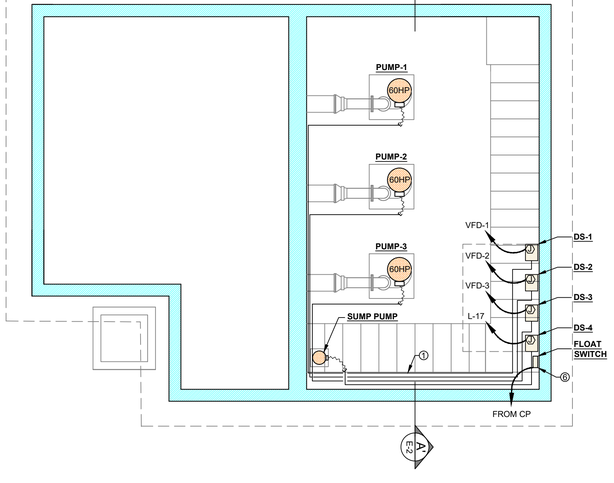
ELECTRICAL KEY NOTES

1. INTERIOR EXPOSED CONDUIT IN CLASS 1, DIVISION 1 AREA SHALL BE IN STAINLESS STEEL SS-316. (TYPICAL).
2. THE EXHAUST FAN EF-1 WILL BE OPERATED FROM A NEW MOTOR STARTER INSTALLED NEXT TO IT. THE EXHAUST FAN WILL BE TURN OFF WITH A SIGNAL FROM THE CONTROL PANEL (CP) IF THE WATER SENSOR ON THE BELOW LEVEL IS ACTIVATED. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR.
3. INDICATED FIXTURES SHALL BE EQUIPPED WITH BATTERY PACKS PROVIDING MINIMUM 2 HOURS EMERGENCY OPERATION. EXP-EMG-12W-2L-STCHN-WOSPS ELX-CLASS 1, DIVISION 1 (OR EQUIVALENT).
4. ALARM STROBE LIGHT INSTALLED OUTSIDE AND CONNECTED TO THE CONTROL PANEL (CP). 105XBRIRGA120A + 105BM, EDWARDS. RELE CR205.
5. DISCONNECT SWITCH SHALL BE INSTALLED AT AN ELEVATED POSITION. OPERATION SHALL BE PERFORMED USING AN INSULATED DISCONNECT STICK AND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL ONLY. REFERENCE H304612, HUBBELL (OR EQUIVALENT).
6. INSTALL NEW WATER LEVEL FLOAT SWITCH, TO BE SUPERVISED AND CONTROLLED FROM CONTROL PANEL CP. RELE CR322.



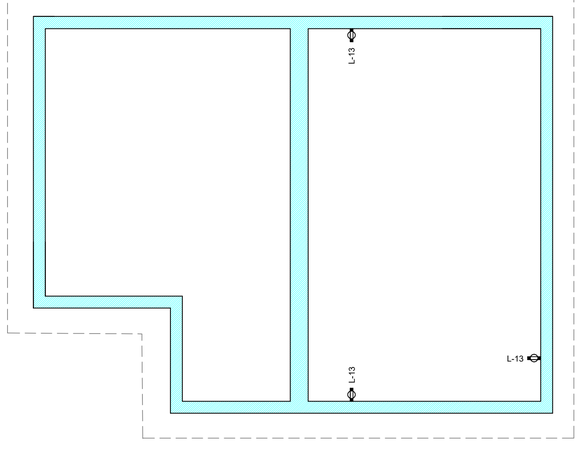
ELEVATION A-A'

SCALE: 1/4" = 1'-0"



ELECTRICAL PLAN BELOW LEVEL - NEW

SCALE: 1/4" = 1'-0"



ELECTRICAL PLAN BELOW LEVEL - RECEPTACLES NEW

SCALE: 1/4" = 1'-0"

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Pembroke Pines, Florida 33029

The City Of PEMBROKE PINES

LEGENDS:

	EXISTING
	NEW ELECTRICAL EQUIPMENT
	NEW MECHANICAL EQUIPMENT
CB	CIRCUIT BREAKER
MTS	MANUAL TRANSFER SWITCH
TRF	TRANSFORMER
JB	JUCTION BOX

P.E. SEAL

TO THE BEST OF OUR KNOWLEDGE THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODE

Pedro Arias, P.E.
Florida Registration. No. 63813

REV No.	DATE	DESCRIPTION
-	10-13-25	ISSUED FOR BID

PROJECT:

MASTER LIFT STATION #4 PUMPS ADDITION

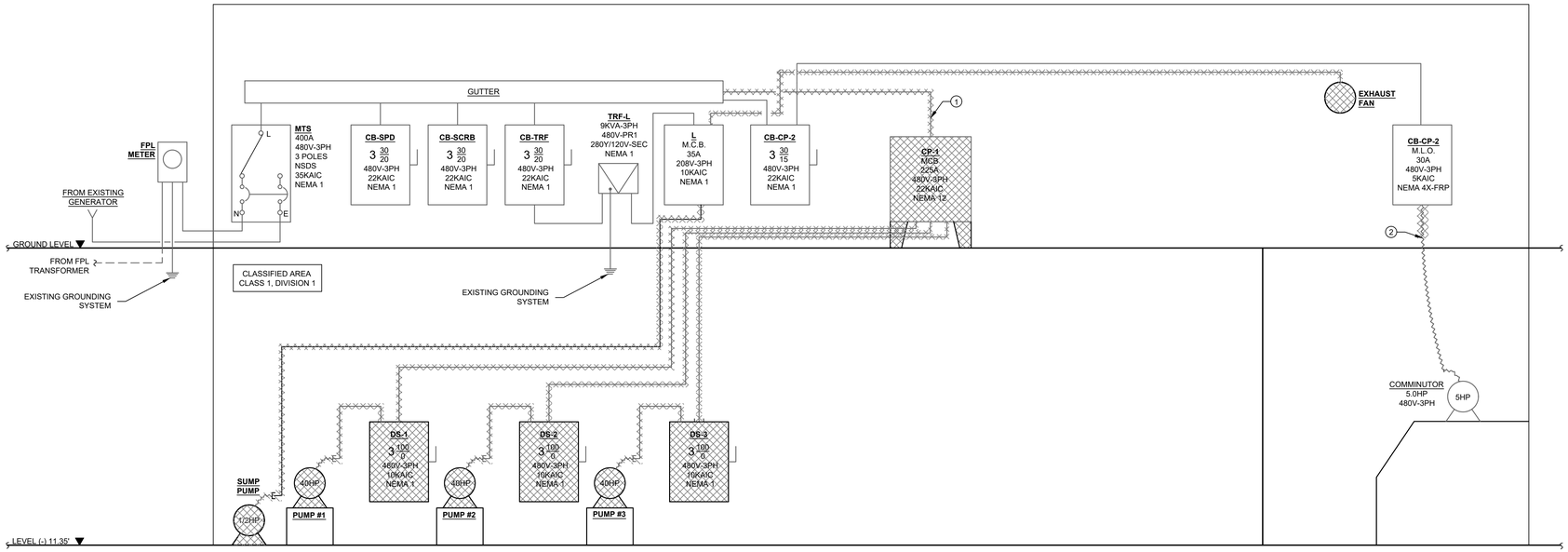
PROJECT ADDRESS:
SW 114 Ave -Washington St.
PEMBROKE PINES, FL 33024

CONTENTS:
ELECTRICAL ABOVE PLAN - NEW
ELECTRICAL BELOW PLAN - NEW

SCALE :INDICATED	DATE:05-20-24
DRAWN:J.MEDINA	DWG FILE:23-108-E2
APPROVED:P.ARIAS	PROJECT NO.:23-108

SHEET No.:
E - 2

SHEET:	OF:
2	5

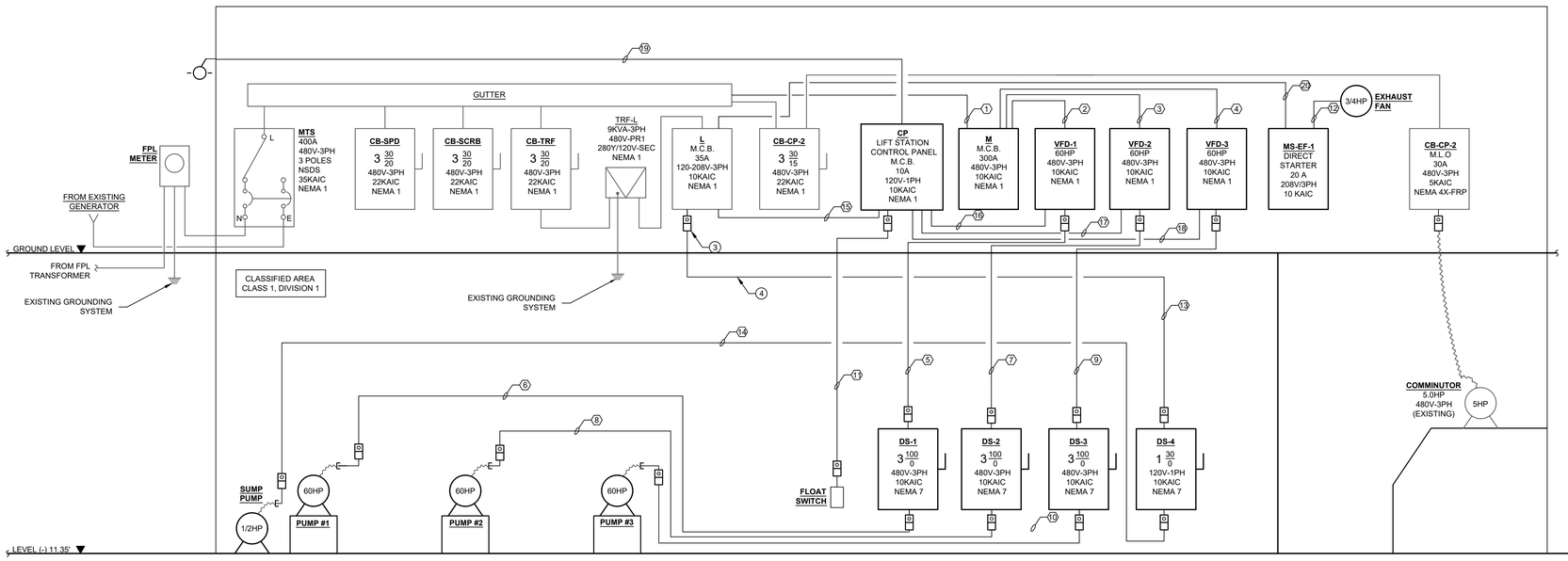


ELECTRICAL RISER - DEMOLITION

SCALE: N.T.S.

ELECTRICAL KEY NOTES

1. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING CONDUIT, WIRE AND BOXES THAT WILL NOT BE REUSED. EXISTING PANELS, CONDUIT AND WIRE MAY BE REUSED IF THEY ARE IN GOOD CONDITION AND MATCH NEW REQUIREMENTS.
2. EXISTING CONDUIT TO BE REUSED. ELECTRICAL CONTRACTOR SHALL EXTEND AND RECONNECT EXISTING CONDUITS AS REQUIRED IF THEY ARE IN GOOD CONDITION AND MATCH NEW REQUIREMENTS.
3. EYS EXPLOSION PROOF SEALING FITTING AS PER NEC ART 501.10. (TYPICAL).
4. INTERIOR EXPOSED CONDUIT IN CLASS 1, DIVISION 1 AREA SHALL BE IN STAINLESS STEEL SS-316. (TYPICAL).



ELECTRICAL RISER - NEW

SCALE: N.T.S.

CONDUIT & WIRE SCHEDULE

FEEDER NUMBER	LOAD DESCRIPTION	No. OF CONDUITS	SIZE OF CONDUITS	No. & SIZE OF CONDUCTORS IN EACH CONDUIT
1	FROM GUTTER TO PANEL M	1	3"	4#350MCM + 1#4 GND THWN Cu
2	FROM PANEL M TO VFD-1	1	1-1/4"	3#3 + 1#8 GND THWN Cu
3	FROM PANEL M TO VFD-2	1	1-1/4"	3#3 + 1#8 GND THWN Cu
4	FROM PANEL M TO VFD-3	1	1-1/4"	3#3 + 1#8 GND THWN Cu
5	FROM VFD-1 TO DS-1	1	1-1/4"	3#3 + 1#8 GND THWN Cu
6	FROM DS-1 TO PUMP #1	1	1-1/4"	3#3 + 1#8 GND THWN Cu
7	FROM VFD-2 TO DS-2	1	1-1/4"	3#3 + 1#8 GND THWN Cu
8	FROM DS-2 TO PUMP #2	1	1-1/4"	3#3 + 1#8 GND THWN Cu
9	FROM VFD-3 TO DS-3	1	1-1/4"	3#3 + 1#8 GND THWN Cu
10	FROM DS-3 TO PUMP #3	1	1-1/4"	3#3 + 1#8 GND THWN Cu
11	FROM CP TO FLOAT SWITCH	1	1/2"	CONTROL WIRE
12	FROM EF-PANEL TO EXHAUST FAN	1	1/2"	3#12 + 1#12 GND THWN Cu
13	FROM PANEL L TO DS-4	1	1/2"	2#12 + 1#12 GND THWN Cu
14	FROM DS-4 TO SUMP PUMP	1	1/2"	2#12 + 1#12 GND THWN Cu
15	FROM PANEL L TO CP	1	1/2"	2#12 + 1#12 GND THWN Cu
16	FROM CP TO VFD-1	1	1/2"	CONTROL WIRE
17	FROM CP TO VFD-2	1	1/2"	CONTROL WIRE
18	FROM CP TO VFD-3	1	1/2"	CONTROL WIRE
19	FROM CP TO ALARM LIGHT	1	1/2"	CONTROL WIRE
20	FROM CP TO MS-EF-1	1	1/2"	CONTROL WIRE

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The City Of PEMBROKE PINES

LEGENDS:

- EXISTING
- DEMOLITION
- CB — CIRCUIT BREAKER
- MTS — MANUAL TRANSFER SWITCH
- TRF — TRANSFORMER
- JB — JUCTION BOX

P.E. SEAL

TO THE BEST OF OUR KNOWLEDGE THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODE

Pedro Arias, P.E.
Florida Registration. No. 63813

REV No.	DATE	DESCRIPTION
-	10-13-25	ISSUED FOR BID

PROJECT:

MASTER LIFT STATION #4 PUMPS ADDITION

PROJECT ADDRESS:

SW 114 Ave -Washington St.

PEMBROKE PINES, FL 33024

CONTENTS:

ELECTRICAL RISER EXISTING/DEMOLITION - NEW

SCALE :INDICATED	DATE:05-20-24
DRAWN:J.MEDINA	DWG FILE:23-108-E3
APPROVED:P.ARIAS	PROJECT NO.:23-108

SHEET No.:

E - 3

SHEET:	OF:
3	5

TYPE: PANELBOARD
SERVICE: POWER
VOLTAGE: 480V,3PH,4W
ENCLOSURE: NEMA 1

PANEL M
(New)

MAIN BUS: 300A
NEUTRAL: 300A
MAINS: M.C.B. 300A
A.I.C. 10K

AMPS	POLE	TOTAL VA	COND	WIRE	DESC	CKT No.	PHASE		CKT No.	DESC	WIRE	COND	TOTAL VA	POLE	AMPS
-	-	-	-	-	SPACE	1			2						
-	-	-	-	-	SPACE	3			4	VFD-1 / PUMP #1	3	1-1/4"	63,987	3	100
-	-	-	-	-	SPACE	5			6						
-	-	-	-	-	SPACE	7			8						
-	-	-	-	-	SPACE	9			10	VFD-2 / PUMP #2	3	1-1/4"	63,987	3	100
-	-	-	-	-	SPACE	11			12						
-	-	-	-	-	SPACE	13			14						
-	-	-	-	-	SPACE	15			16	VFD-3 / PUMP #3	3	1-1/4"	63,987	3	100
-	-	-	-	-	SPACE	17			18						

TOTAL CONNECTED LOAD GE1: 191,961 VA 231 AMPS
TOTAL DEMAND LOAD (LOAD @125%): 239,951 VA 289 AMPS
FEEDER: 4#350MCM + 1#4 GND IN 2-1/2" C.
FED FROM: MTS

TYPE: PANELBOARD
SERVICE: POWER
VOLTAGE: 120/208V,3PH,4W
ENCLOSURE: NEMA 1

PANEL L
(Existing-Modified)

MAIN BUS: 60A
NEUTRAL: 60A
MAINS: M.L.O.
A.I.C. 10K

AMPS	POLE	TOTAL VA	COND	WIRE	DESC	CKT No.	PHASE		CKT No.	DESC	WIRE	COND	TOTAL VA	POLE	AMPS
30	3	1,620	1/2"	10	EXISTING LOAD	1			2						
						3			4	EXISTING LOAD	12	1/2"	360	3	15
						5			6						
-	-	-	-	-	SPACE	7			8	GFCI RECEPTACLES	12	1/2"	360	1	20
-	-	-	-	-	SPACE	9			10	GEN. HEAT	12	1/2"	500	1	20
20	1	360	1/2"	12	DOWNSTAIRS - RECEPT.	11			12	GEN BATTERY CHARGER	12	1/2"	500	1	20
20	1	400	1/2"	12	DOWNSTAIRS - LIGHTS	13			14	UPSTAIRS-RECEP.	12	1/2"	360	1	20
-	-	-	-	-	SPACE	15			16	UPSTAIRS-LIGHTS	12	1/2"	600	1	20
20	1	500	1/2"	12	SUMP PUMP	17			18	CONTROL PANEL (CP) (a)	12	1/2"	600	1	15
15	6	1,080	1/2"	12	EXISTING LOAD	19			20						
						21			22	EF-1 (a)	12	1/2"	1260	3	15
						23			24						
35	3	-	-	-	MAIN BREAKER	25			26	SPACE	-	-	-	-	-
						27			28	SPACE	-	-	-	-	-
						29			30	SPACE	-	-	-	-	-

TOTAL CONNECTED LOAD GE1: 8,500 VA 24 AMPS
FEEDER: 4#8 AWG + 1#10 GND IN 3/4"" C.
FED FROM: MTS

NOTES:

(a) NEW BREAKER AND NEW WIRE

GUTTER - SERVICE LOAD CALCULATION
(Existing)

DESCRIPTION	LOAD
CIRCUIT BREAKER CB-SURGE PROTECTION DEVICE	0 V.A.
CIRCUIT BREAKER CB-SCRUBBER	2,000 V.A.
CIRCUIT BREAKER CB-TRF (TRF-L - PANEL L)	8,500 V.A.
CB-CP-2 (COMMINUTOR)	6,316 V.A.
CONTROL PANEL-CP-1 (a)	162,045 V.A.
TOTAL LOAD:	178,861 V.A.
TOTAL LOAD @ 480V-3PH:	215 AMPS
DEMAND LOAD (LOAD @125%)	223,576 V.A.
DEMAND LOAD (LOAD @125%)	269 AMPS
EXISTING SERVICE @ 480V-3PH	400 AMPS

NOTES:
(a) EXISTING ELECTRICAL PANEL TO BE DEMOLISHED.

GUTTER - SERVICE LOAD CALCULATION
(Existing-Modified)

DESCRIPTION	LOAD
CIRCUIT BREAKER CB-SURGE PROTECTION DEVICE	0 V.A.
CIRCUIT BREAKER CB-SCRUBBER	2,000 V.A.
CIRCUIT BREAKER CB-TRF (TRF-L - PANEL L)	8,500 V.A.
CB-CP-2 (COMMINUTOR)	6,316 V.A.
PANEL-M (a)	191,961 V.A.
TOTAL LOAD:	208,777 V.A.
TOTAL LOAD @ 480V-3PH:	251 AMPS
DEMAND LOAD (LOAD @125%)	260,971 V.A.
DEMAND LOAD (LOAD @125%)	314 AMPS
EXISTING SERVICE @ 480V-3PH	400 AMPS

NOTES:
(a) NEW LOAD.

VARIABLE FRECUENCY DRIVE (VFD)

TAG	MANUFACTURER	HP	V / PH / Hz	MODEL
VFD-1	SCHNEIDER ELECTRIC	60	480 / 3 / 60	ATV630D55S6
VFD-2	SCHNEIDER ELECTRIC	60	480 / 3 / 60	ATV630D55S6
VFD-3	SCHNEIDER ELECTRIC	60	480 / 3 / 60	ATV630D55S6

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LEGENDS:

P.E. SEAL
TO THE BEST OF OUR KNOWLEDGE THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODE

Pedro Arias, P.E.
Florida Registration. No. 63813

REV No.	DATE	DESCRIPTION
-	10-13-25	ISSUED FOR BID

PROJECT:

MASTER LIFT STATION #4 PUMPS ADDITION

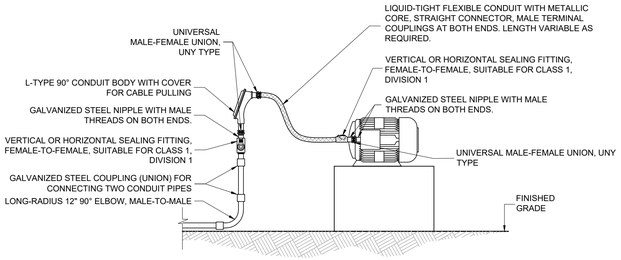
PROJECT ADDRESS:
SW 114 Ave -Washington St.
PEMBROKE PINES, FL 33024

CONTENTS:
PANEL SCHEDULES
LOAD CALCULATION

SCALE :INDICATED	DATE:05-20-24
DRAWN:J.MEDINA	DWG FILE:23-108-E4
APPROVED:P.ARIAS	PROJECT NO.:23-108

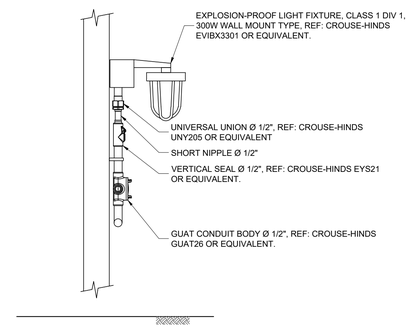
SHEET No.: E - 4

SHEET: 4 OF: 5



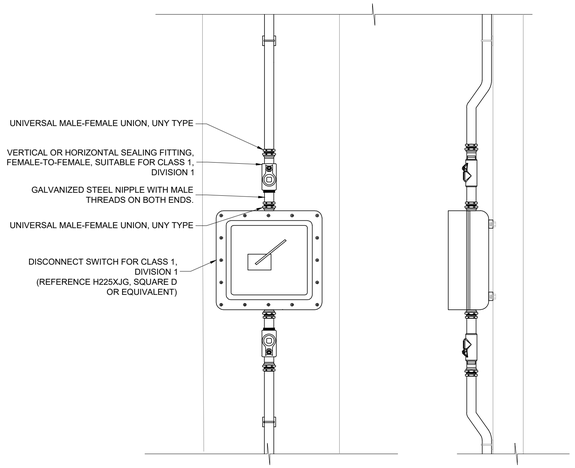
MOTOR POWER AND CONTROL ASSEMBLY - CL.1 DIV.1

NOT TO SCALE



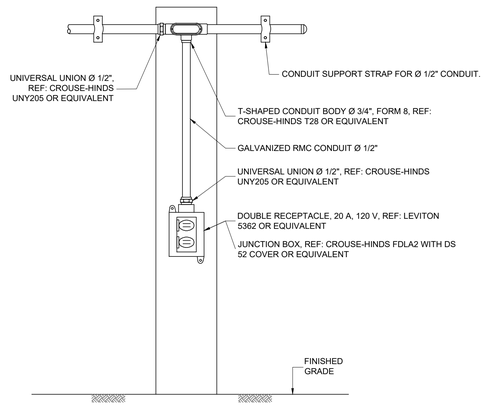
LIGHT FIXTURE ASSEMBLY - CL.1 DIV.1

NOT TO SCALE



DISCONNECT SWITCH ASSEMBLY - CL.1 DIV.1

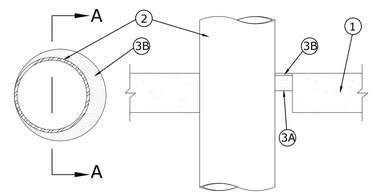
NOT TO SCALE



RECEPTACLE ASSEMBLY - CL.1 DIV.1

NOT TO SCALE

System No. C-AJ-1571
April 18, 2007
F Rating - 2 Hr
T Rating - 0, 1/4 and 1/2 Hr



SECTION A - A

1. **Floor or Wall Assembly** - Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 10-1/4 in.

See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants** - One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between tube and periphery of opening shall be min 0 in. to max 2-3/4 in. Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubings may be used:

A. **Steel Pipe** - Nom 8 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. **Conduit** - Nom 6 in. diam (or smaller) steel conduit, or nom 4 in. (or smaller) steel electrical metallic tubing.
C. **Copper Tubing** - Nom 4 in. diam (or smaller) Type L (or heavier) copper tube.
D. **Copper Pipe** - Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.

T Rating is 1/2 hr when annular space is 1-7/8 in. or less and min 1/2 in. thickness of sealant and min 4 in. thickness of mineral wool is used. T Rating is 1/4 hr when annular space is 1-7/8 in. or less, and min 1/4 in thickness of sealant and min 2 in. thickness of mineral wool is used. The T Rating is 0 hr for annular spaces greater than 1-7/8 in.

3. **Firestop System** - The details of the firestop system shall be as follows:

A. **Packing Material** - Min 2 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.
B. **Fill Void or Cavity Materials* - Caulk** - Min 1/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. Min 1/2 in. diam bead of caulk applied to the penetrant/concrete interface at the point contact location on the top surface of floor or both surfaces of wall.

FLAME TECH INC - Firestop 814+ (UL479/ASTM-E814) sealent (filler for through penetration).

FIRE STOP DETAIL

NOT TO SCALE

INGEMEL S.A.
ENGINEERING COMPANY
State of Florida CA No. 9113
20871 Johnson Street, Suite 115
Phone: (954) 318-2264 Fax: (954) 450-7216
Pembroke Pines, Florida 33029

The City Of PEMBROKE PINES

LEGENDS:

P.E. SEAL
TO THE BEST OF OUR KNOWLEDGE THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODE

Pedro Arias, P.E.
Florida Registration. No. 63813

REV No.	DATE	DESCRIPTION
-	10-13-25	ISSUED FOR BID

PROJECT:

MASTER LIFT
STATION #4
PUMPS ADDITION

PROJECT ADDRESS:
SW 114 Ave -Washington St.
PEMBROKE PINES, FL 33024

CONTENTS:
DETAILS

SCALE :INDICATED	DATE:05-20-24
DRAWN:J.MEDINA	DWG FILE:23-108-E5
APPROVED:P.ARIAS	PROJECT NO.:23-108

SHEET No.:
E - 5

SHEET:	OF:
5	5

DRAFT DOCUMENT FOR COMMISSION REVIEW

LIFT STATION 4
- SUBMERSIBLE PUMPS CONTROL PANEL -
CITY OF PEMBROKE PINES

DRAWING INDEX

GENERAL NOTES

1. ALL PRE-WIRED CONTROL PANELS SHALL BE U.L. LISTED AND LABELED, PRIOR TO INSTALLATION.
2. ENCLOSURE MUST BE NEMA 3RX 304 SS WITH SUBPANEL AND INNER DOOR.
3. PANEL MUST INCLUDE DRIP SHIELD.
4. PANEL MUST BE PROVIDED WITH TEMPERATURE CONTROL.
5. USE CONDUIT HUBS WITH THE SAME ENVIRONMENTAL RATING AS ENCLOSURE .
6. PANEL MUST INCLUDE ALL ELEMENTS DESCRIBED IN WIRING DIAGRAM SIZED FOR THE CORRESPONDING SERVICE AND PUMP SIZE.
7. AMPS INTERRUPTING CAPACITY NOTED ON SCHEDULE
8. GENERATOR RECEPTACLE MUST INCLUDE REVERSED CONTACTS. MUST BE ASSEMBLED WITH PLUG INTERIOR (EXPOSED CONTACTS) PLUG ASSEMBLED WITH RECEPTACLE INTERIOR (RECESSED CONTACTS) FOR APPLICATIONS WHERE PLUG IS ENERGIZED TO FEED NORMALLY DE-ENERGIZED RECEPTACLE. (S22 OPTION ADDED TO MODEL IN SCHEDULE).
9. SUPPORT RACK DETAIL AND MATERIALS OF CONSTRUCTION BY OTHERS
10. SERVICE AND METER ATTACHED TO BACK SIDE OF PUMP STATION CONTROL CENTER (WHEN APPLICABLE.)
11. ALL ELECTRICAL EQUIPMENT AND APPURTENANCES ARE IN COMPLIANCE WITH N.E.C. 110-16.
12. PUMP STATION MUST BE SUPPLIED WITH A REMOTE-TELEMETRY MONITORING UNIT R.T.U. THAT ALLOWS REMOTE MONITORING OF PUMPS' STATUS, LAG ALARM, HIGH ALARM, AND POWER FAILURE. R.T.U. EQUIPPED WITH A BATTERY BACK UP AND must be INSTALLED ABOVE THE 100 YEAR FLOOD ELEVATION.
13. THE DESIGN, SUBMITTAL, SUPPLY, SIZING, AND INSTALLATION OF ALL INCOMING POWER FEEDS, GROUNDING, AND GROUNDING CONDUCTORS ARE TO BE PROVIDED BY OTHERS; AND ARE REQUIRED TO COMPLY WITH THE NATIONAL ELECTRIC CODE AND ALL OTHER LOCAL BUILDING CODES.

LEGENDS

AH	ALARM HORN
AL	ALARM LIGHT
AS	ALTERNATING SWITCH
CB	CIRCUIT BREAKER
DS	DOOR SWITCH
ETM	ELAPSED TIME METER
FU	FUSE
HTE	HEATING ELEMENT
LF	LIGHT FIXTURE
MC	MODBUS CONVERTER
MI	MECHANICAL INTERLOCK
MR	MODBUS RELAY
MS	MOTOR STARTER
PB	PUSHBUTTON
PDB	POWER DISTRIBUTION BLOCK
PL	PILOT LIGHT
PS	POWER SUPPLY
R	RELAY
RC	RECEPTACLE
SLPD	SURGE LIGHTING PROTECTION DEVICE
SS	SELECTOR SWITCHT
TS	TEMPERATURE SWITCH
VM	VOLTAGE MONITOR
XF	TRANSFORMER

Rev No.	Fecha	Descripcion
1	08-24-25	Owner's Comments and Dry Well Float
0	06-17-25	Owner's Review

INGEMEL S.A.
ENGINEERING COMPANY

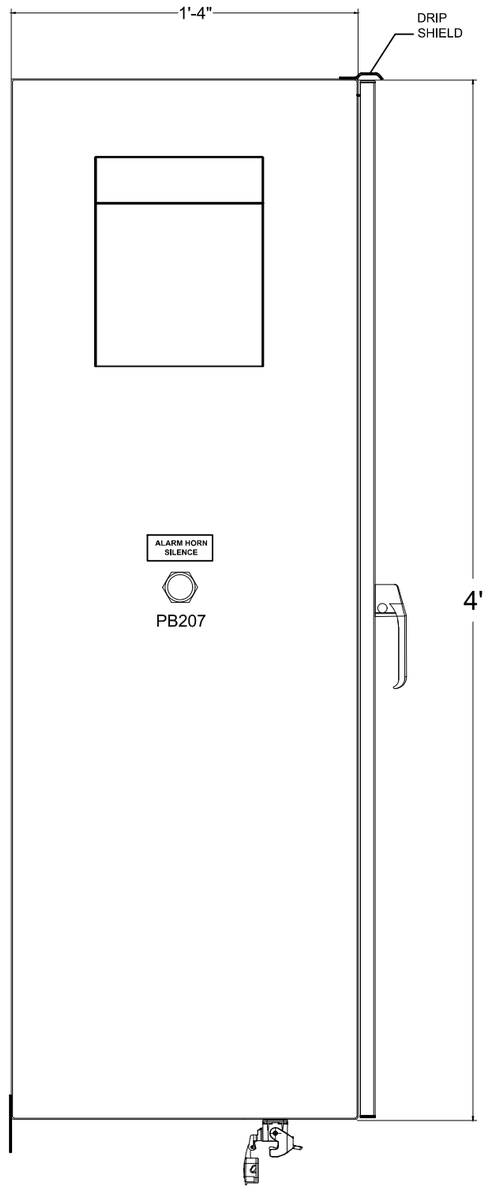
LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

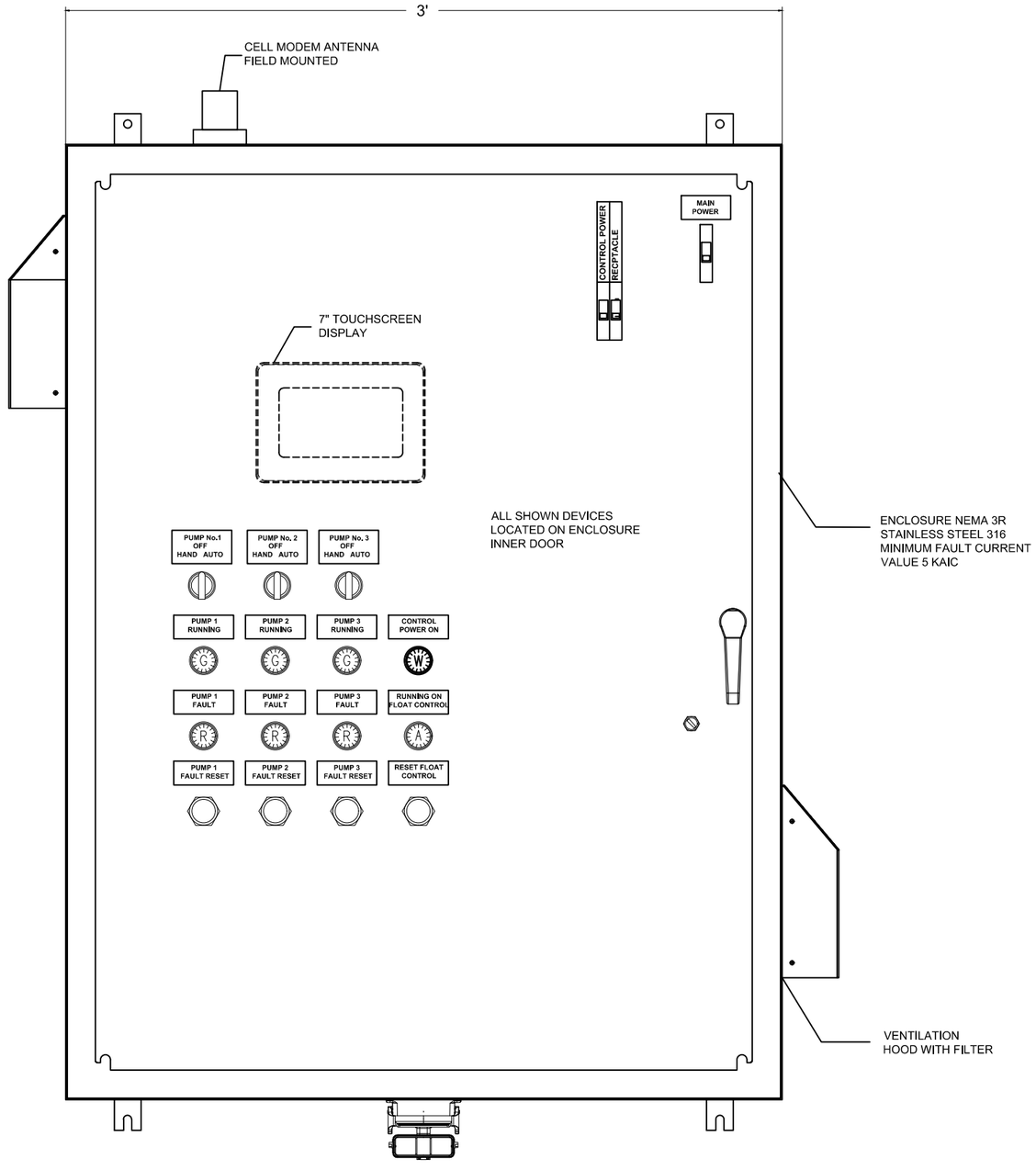
COVER PAGE

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-1-R0.DWG	

No. : **D - 01**

Pag No. : 1 of 13





Rev No.	Fecha	Descripcion
1	08-24-25	Owner's Comments and Dry Well Float
0	06-17-25	Owner's Review

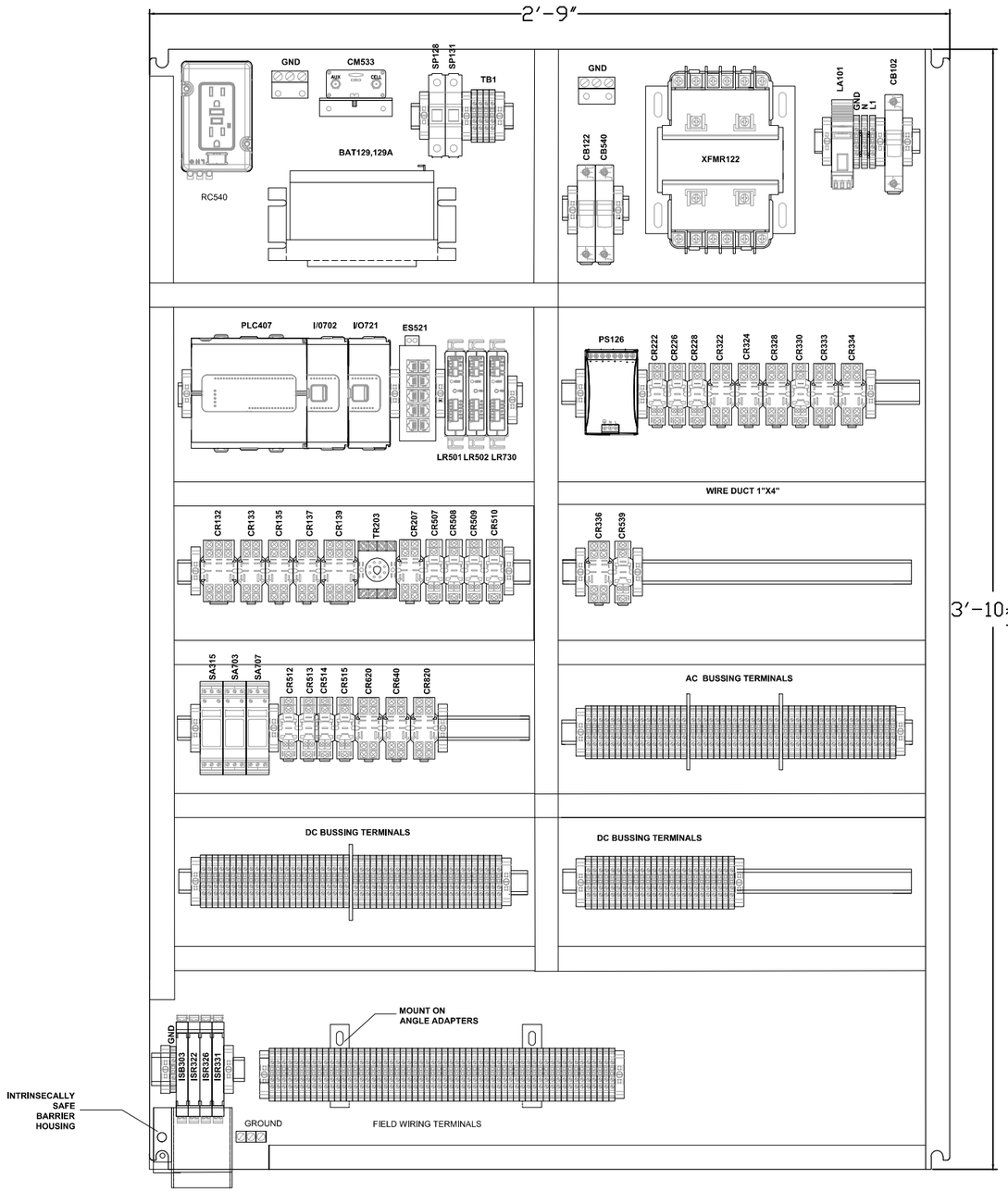
INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

ENCLOSURE DETAIL

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-2-R0.DWG	

No. : **D - 02**



INTRINSECALLY SAFE TERMINAL STRIP

DC BUSSING TERMINALS	AC BUSSING TERMINALS	FIELD WIRING TERMINALS
24VDC	123A	132
24VDC	123A	132A
24VDC	123	133
24VDC	123	133A
24VDC	123	135
24VDC	123	135A
24VDC	123	137
24VDC	123	137A
24VDC	123	140
24VDC	123	140A
24VDC	123	205
24VDC	123	COM
24VDC	123	208
24VDC	123	COM
24VDC	123	315
24VDC	123	316
24VDC	123	SH
24VDC	124	607
24VDC	124	608
24VDC	124	609
24VDC	124	619
24VDC	124	620
24VDC	124	627
24VDC	124	628
24VDC	124	629
24VDC COM	124	639
24VDC COM	124	640
24VDC COM	124	713
24VDC COM	124	713A
24VDC COM	124	714
24VDC COM	124	714A
24VDC COM	124	716
24VDC COM	221	716A
24VDC COM	221	717
24VDC COM	221A	717A
24VDC COM	221A	719
24VDC COM	222	719A
24VDC COM	222	720
24VDC COM	225	720A
24VDC COM	225	807
24VDC COM	226	808
24VDC COM	226	809
24VDC COM	229	819
24VDC COM	229	820
24VDC COM	230	
24VDC COM	230	
24VDC COM	336	
128	336	
128	336	
129	539	
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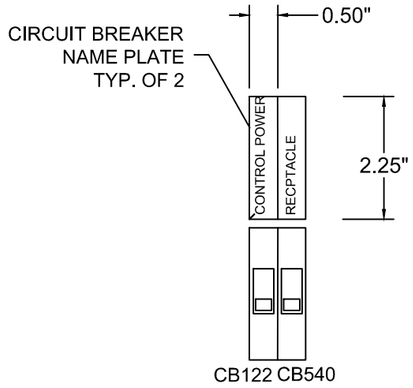
INGEMEL S.A.
ENGINEERING COMPANY

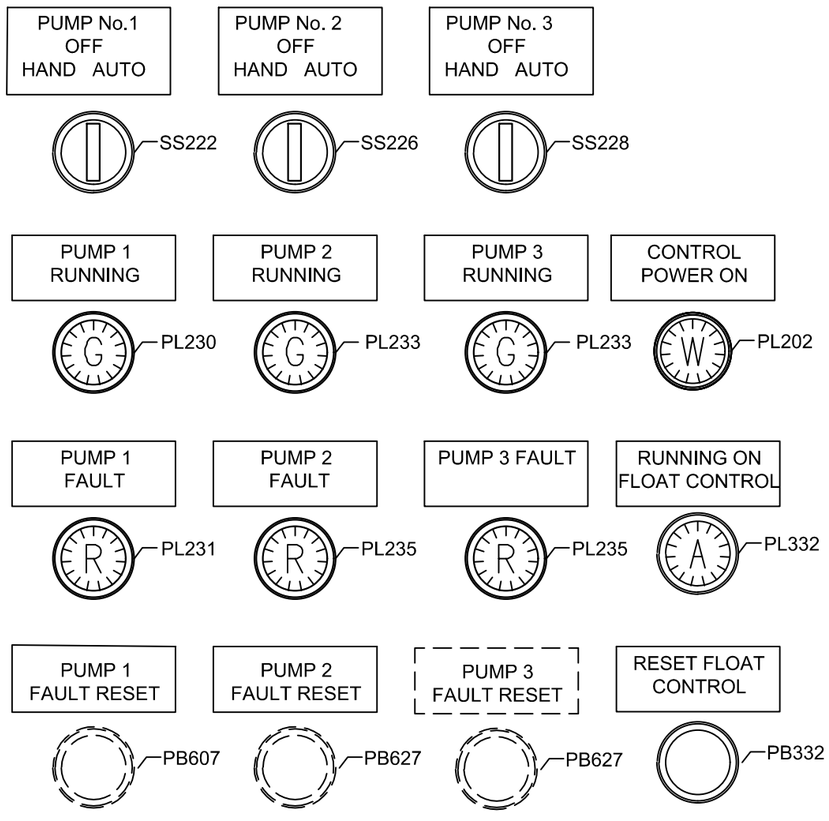
LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

ENCLOSURE INNER SUB PANEL LAYOUT

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-3-R0.DWG	

No. : **D - 03**





NOTE:
ALL NAMEPLATES ARE 2.25" W X 0.75" H BLACK PLASTIC WITH WHITE $\frac{5}{32}$" H FRONT ENGRAVED LETTERING. ADHESIVE BACKED, BEVELED EDGE UNLESS OTHERWISE NOTED.

Rev No.	Fecha	Descripcion
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INGEMEL S.A.
ENGINEERING COMPANY

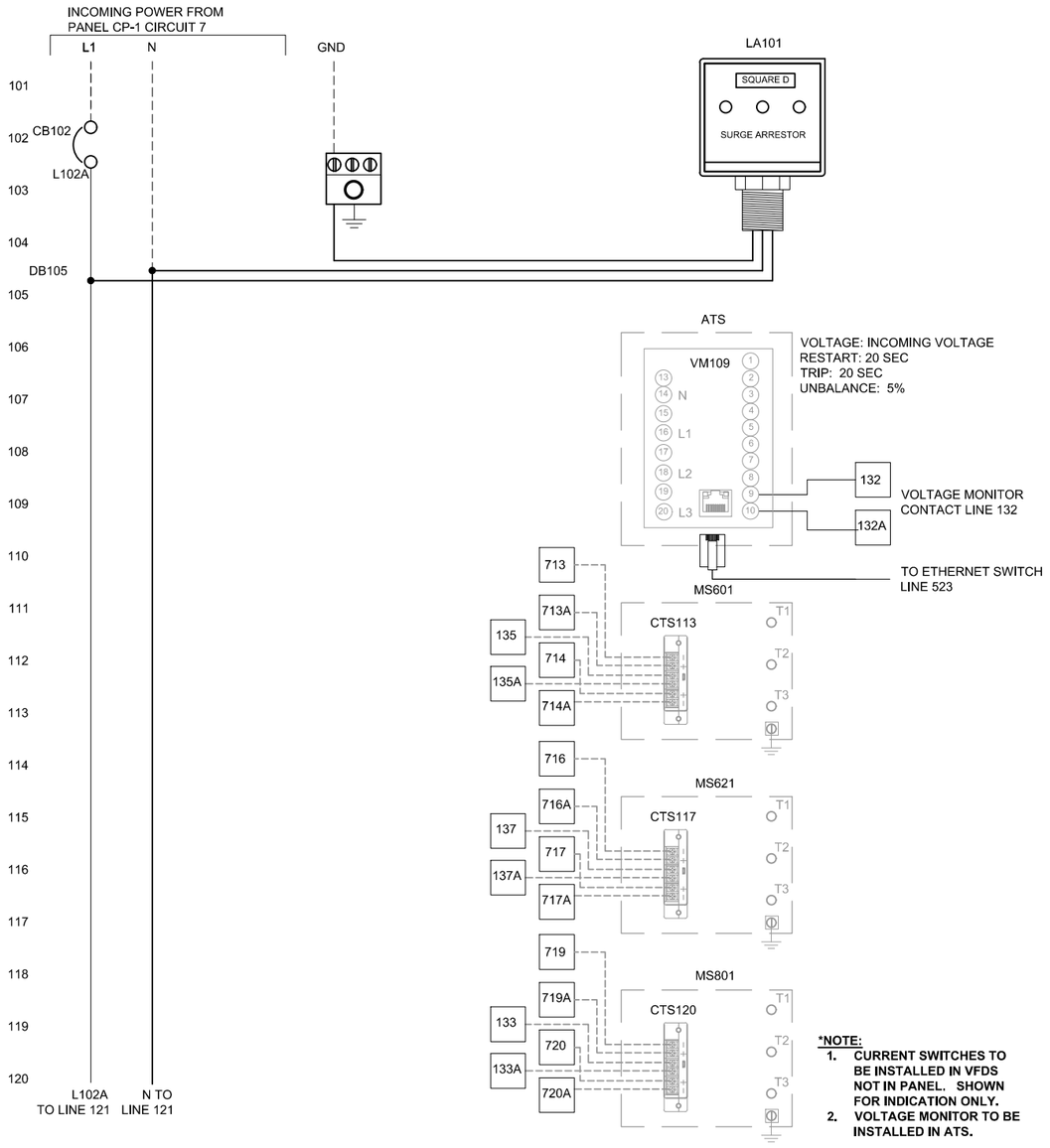
LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

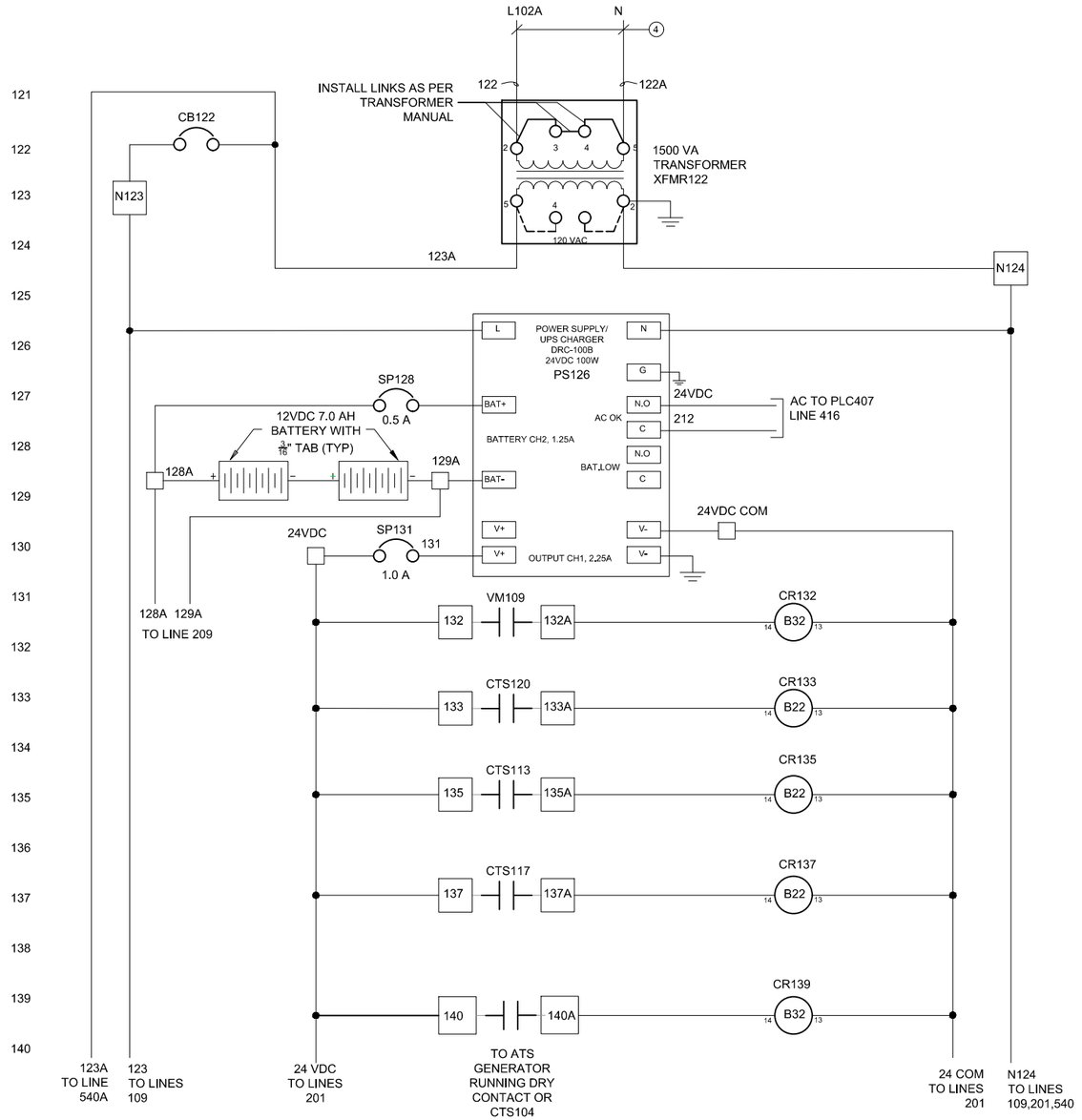
NAMEPLATE DETAIL

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-4-R0.DWG	

No. : **D - 04**

DRAFT DOCUMENT FOR COMMISSION REVIEW





Rev No.	Fecha	Descripcion
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INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

POWER & DC CIRCUITS

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
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No. : **D - 05**

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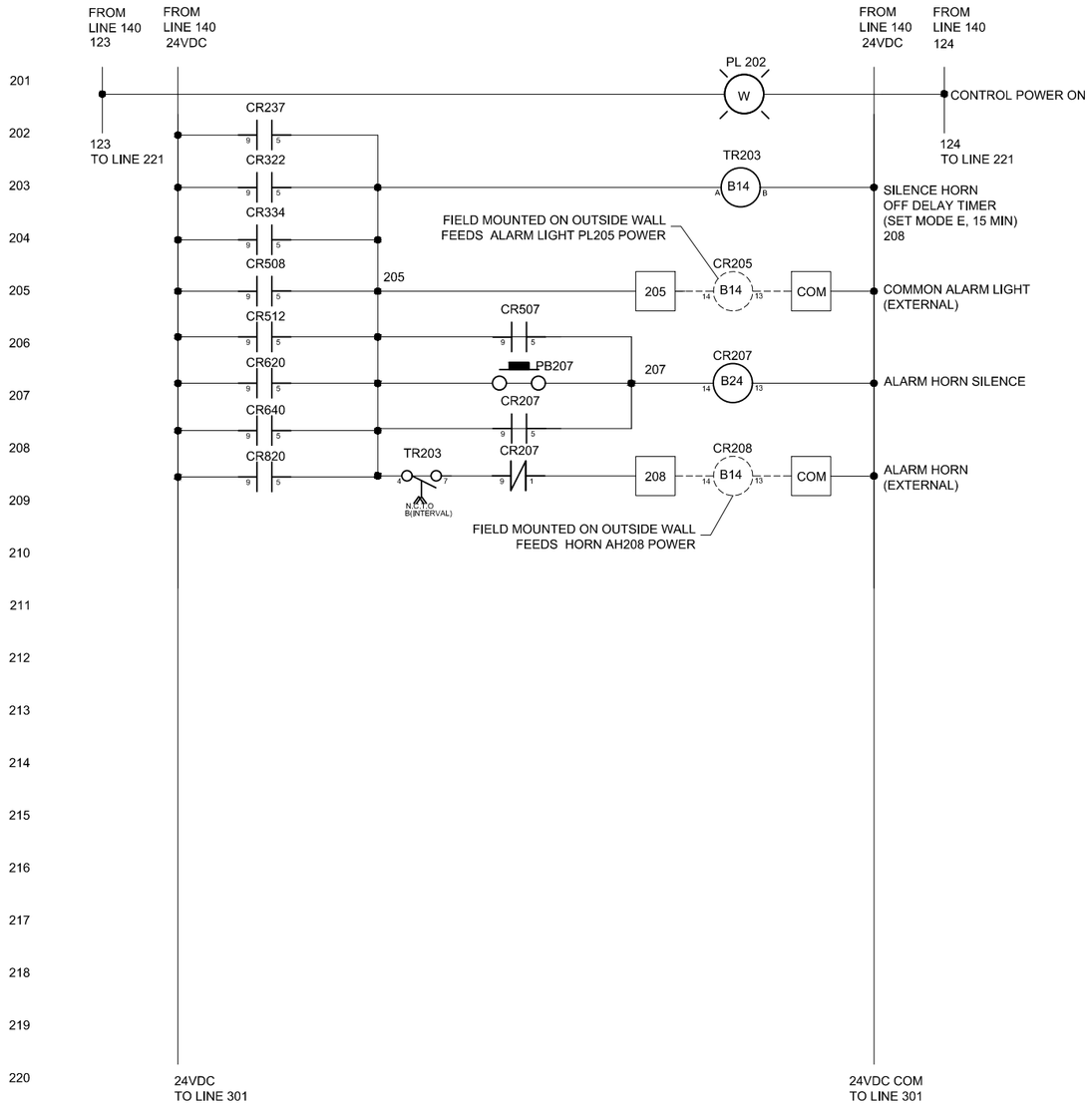

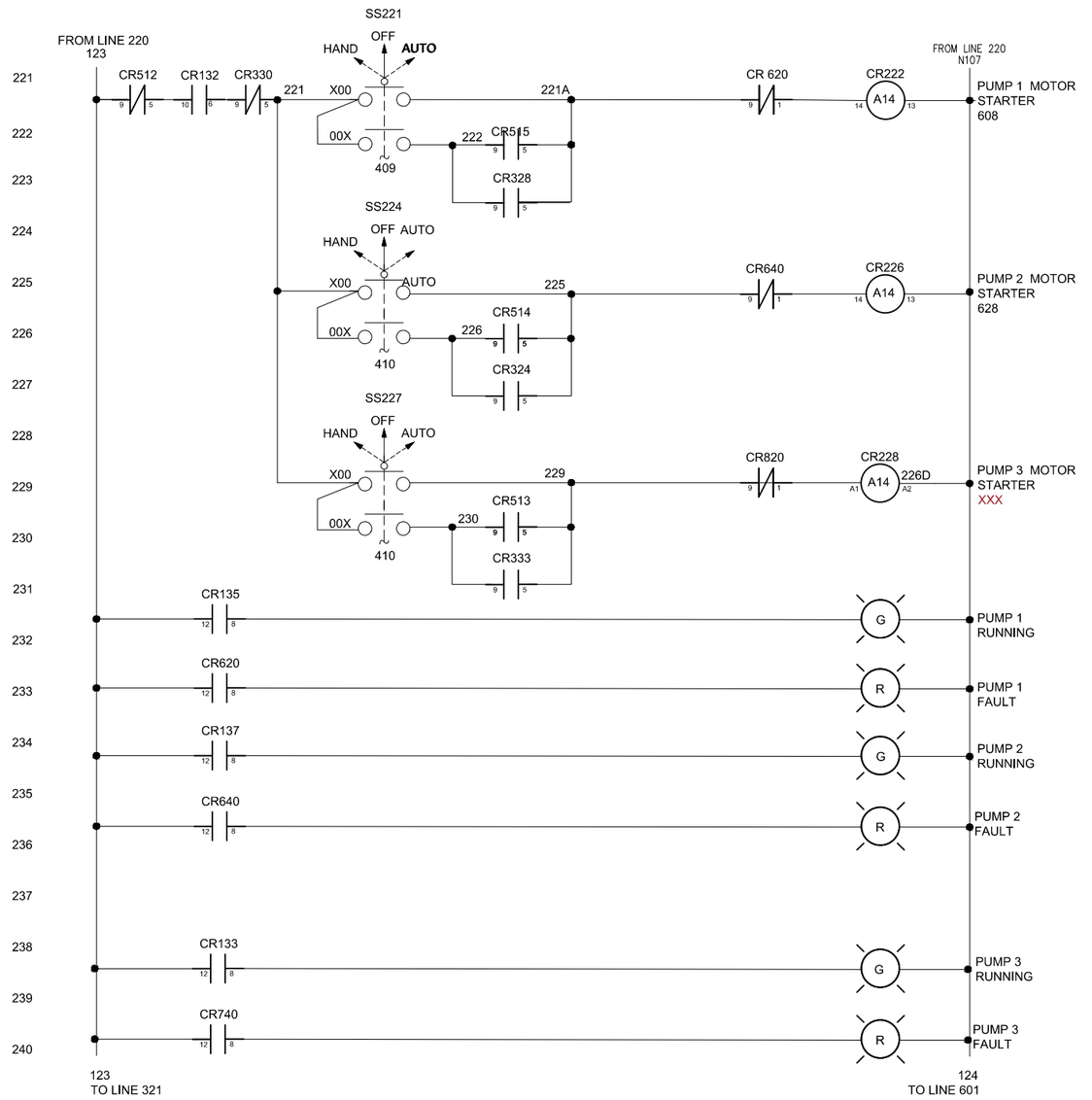

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INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

INDICATORS, ALARMS & CONTROL CIRCUITS

SCALE : N.T.S	DATE : JUN 2025
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DRAWING No. : 23-108-BMS-6-R0.DWG	

No. : **D - 06**

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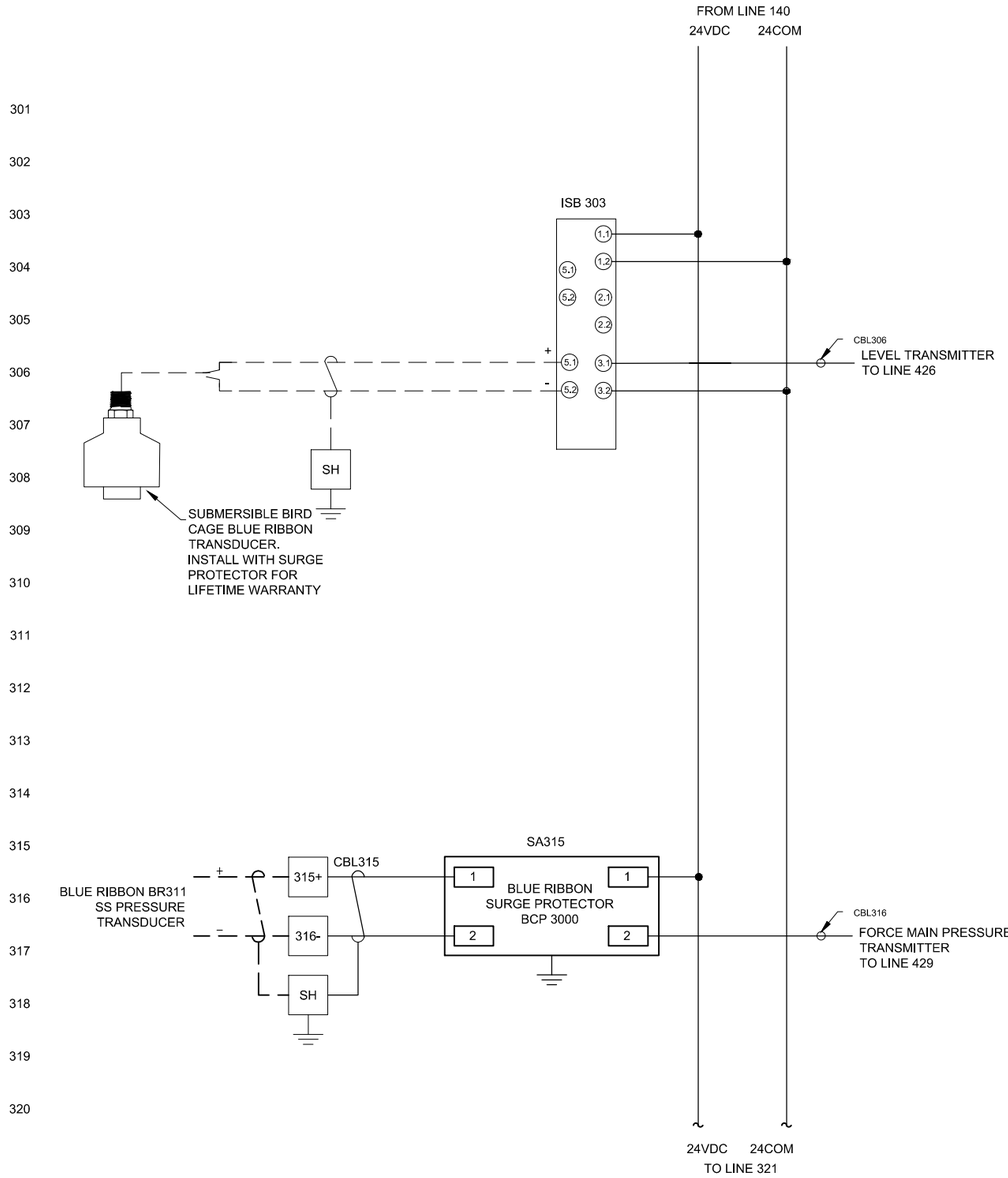

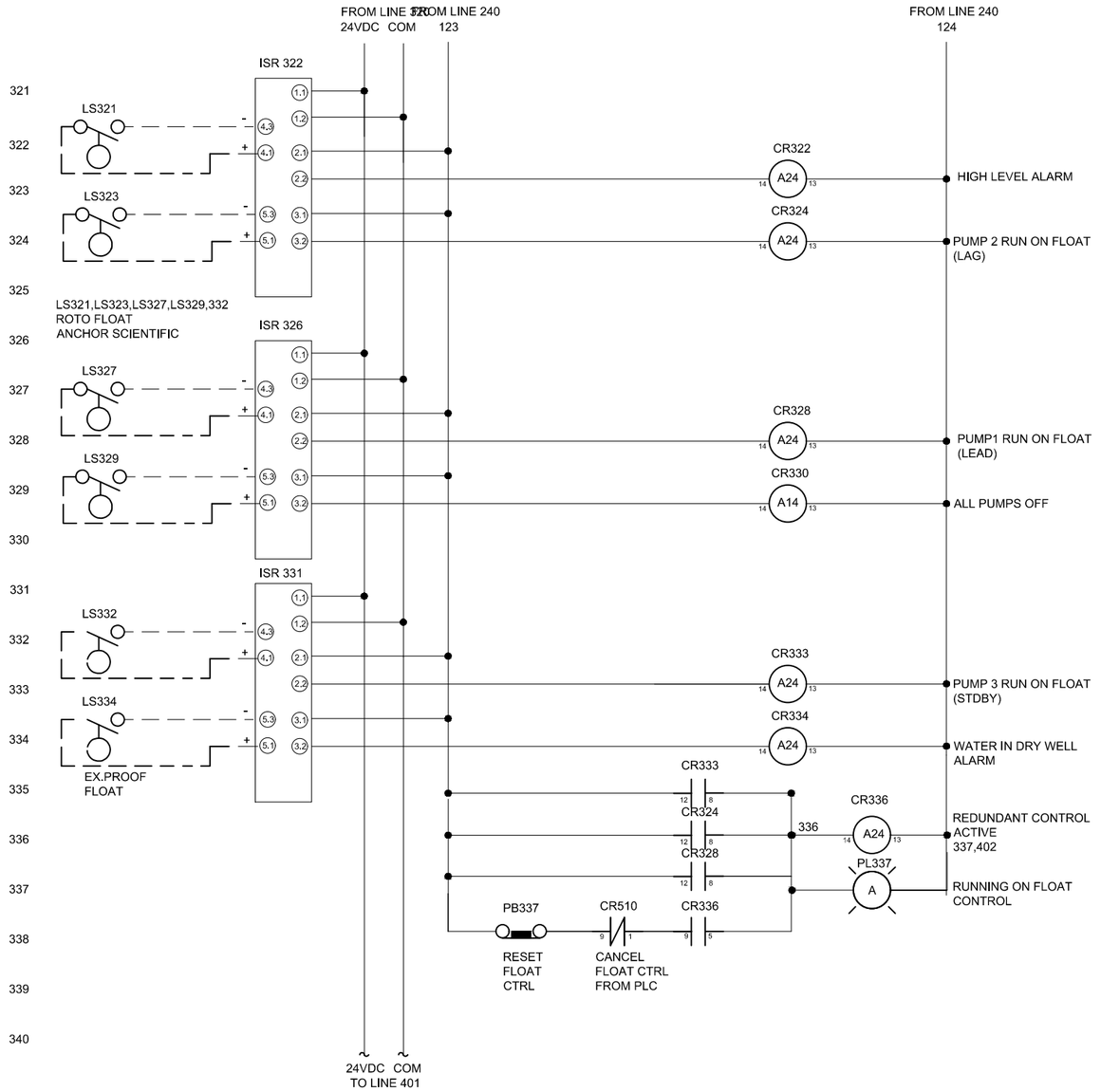

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INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES
LEVEL TRANSDUCER &
FLOAT BACKUP CIRCUIT

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-7-R0.DWG	

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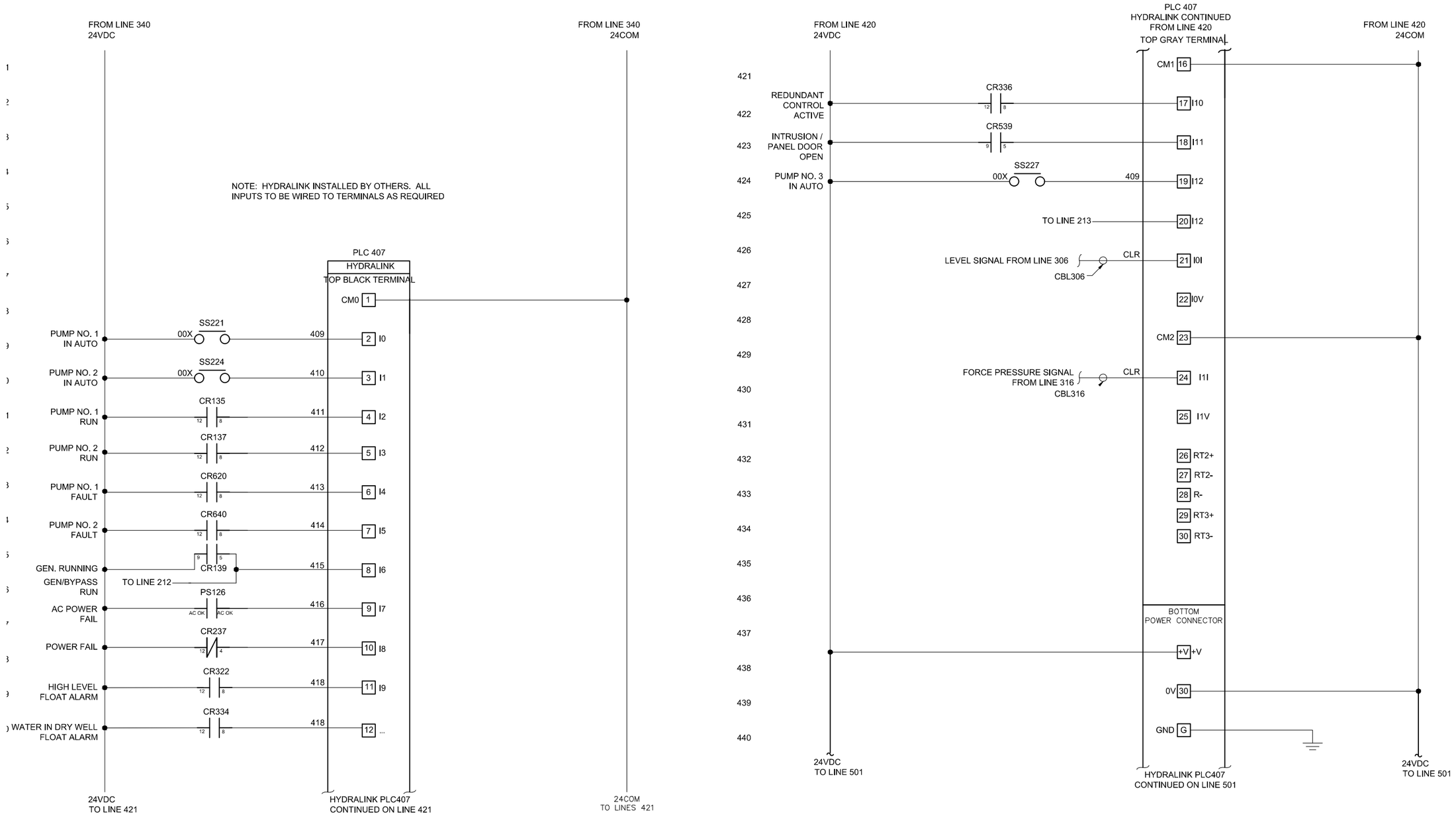

Rev No.	Fecha	Descripcion
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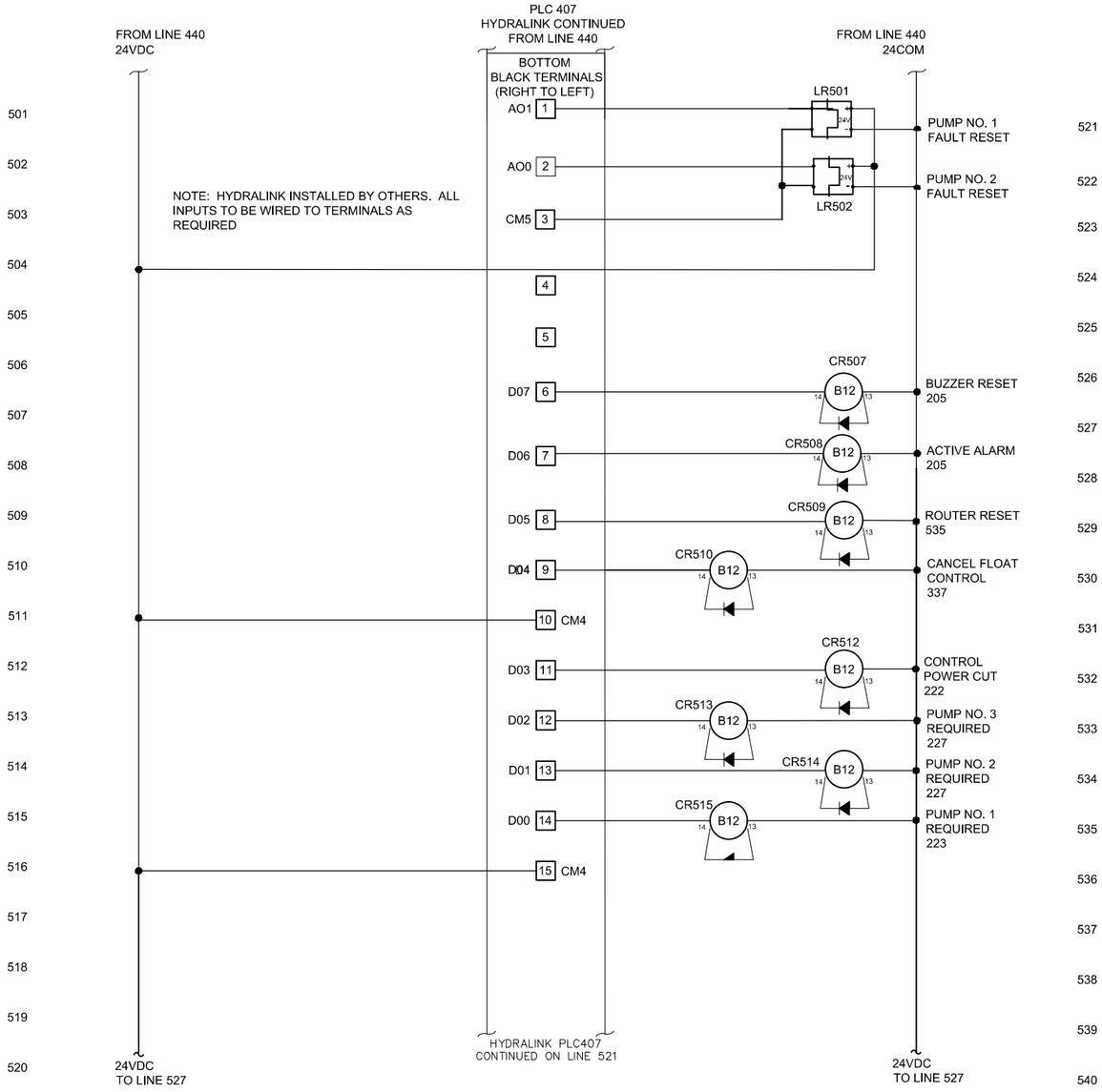
INGEMEL S.A.
ENGINEERING COMPANY

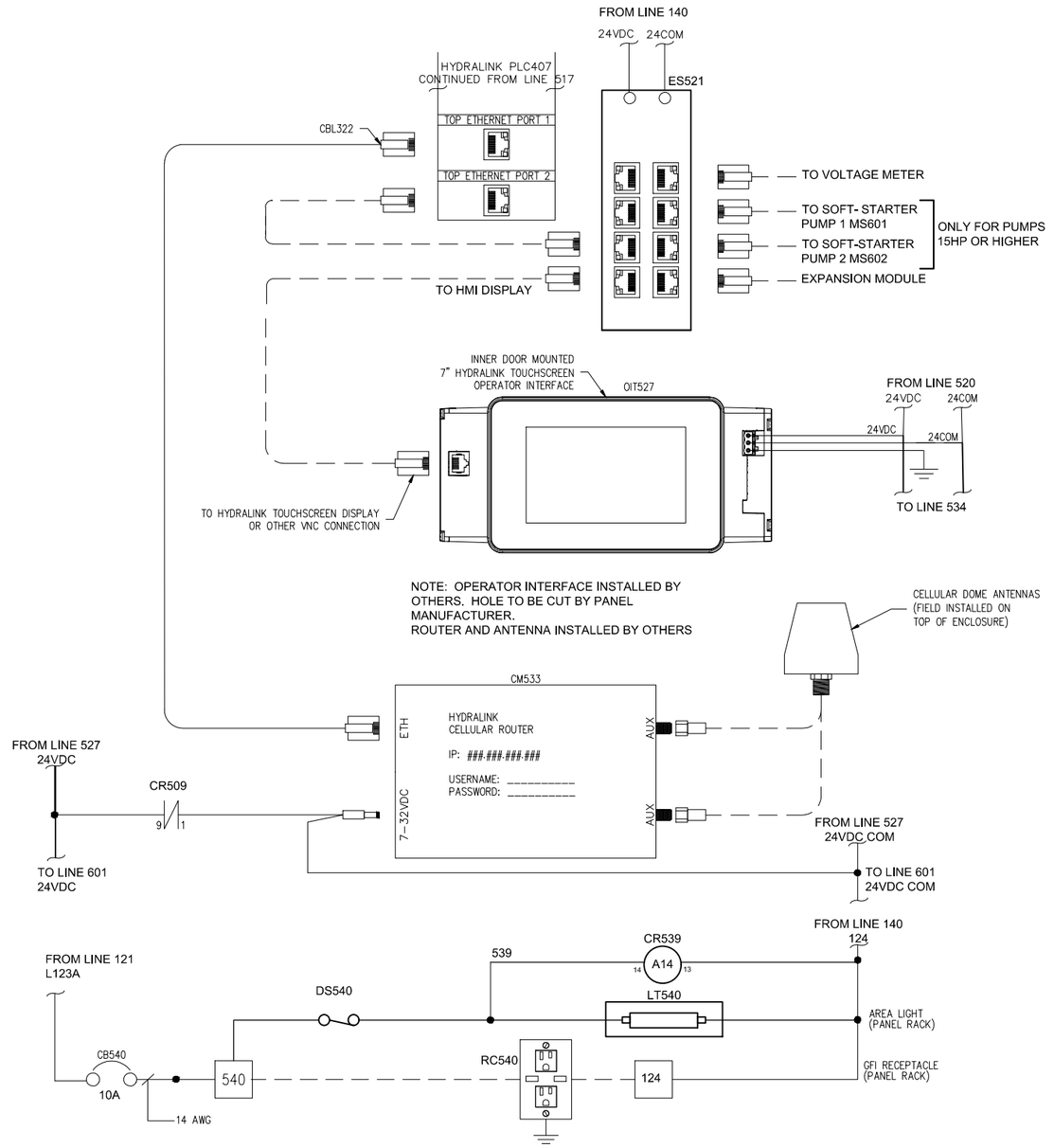
LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

HYDRALINK PLC I/O

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-8-R0.DWG	

No. : **D - 08**





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INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

HYDRALINK I/O, MODEM & IP CIRCUITS

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-9-R0.DWG	

No. : **D - 09**

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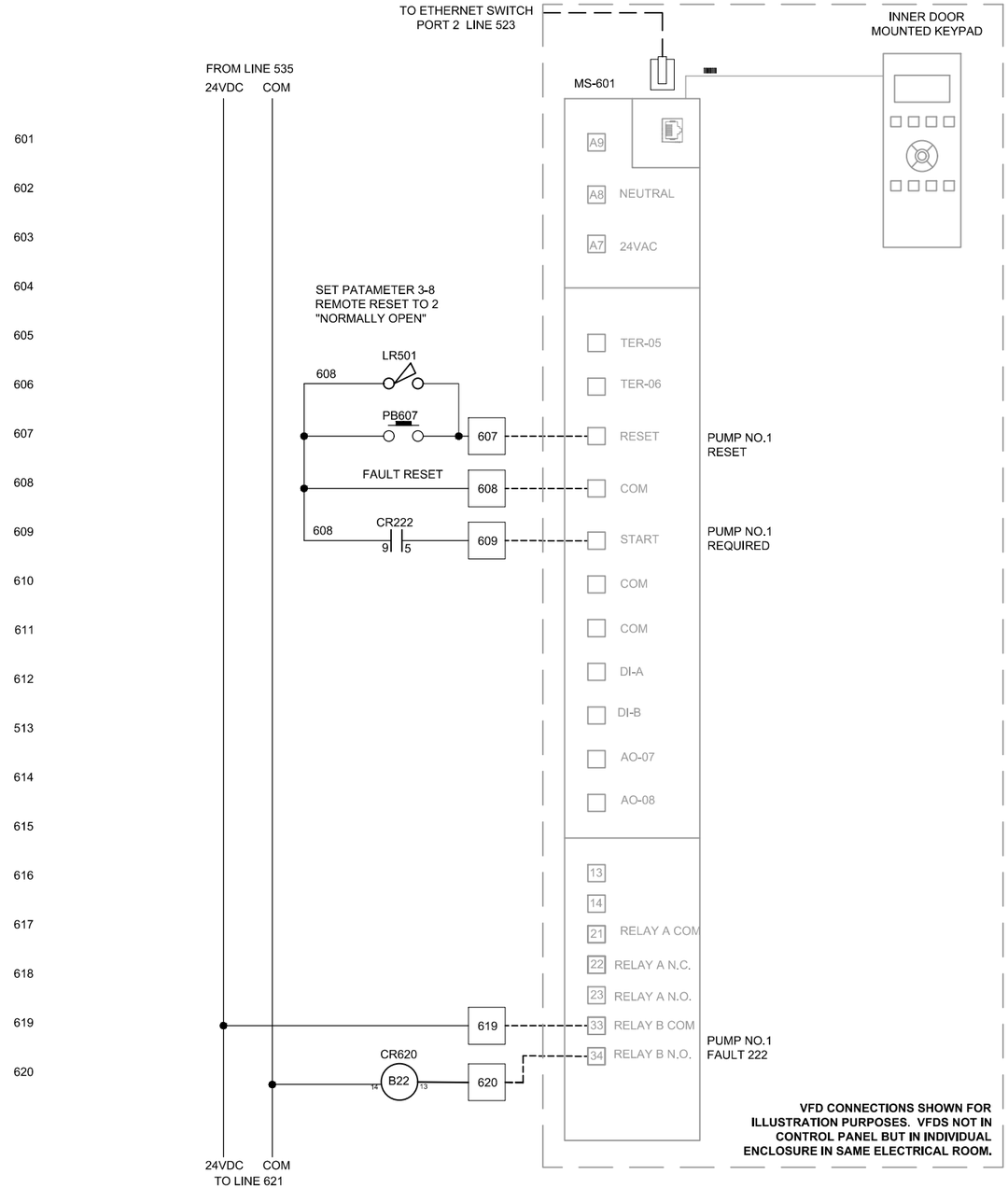

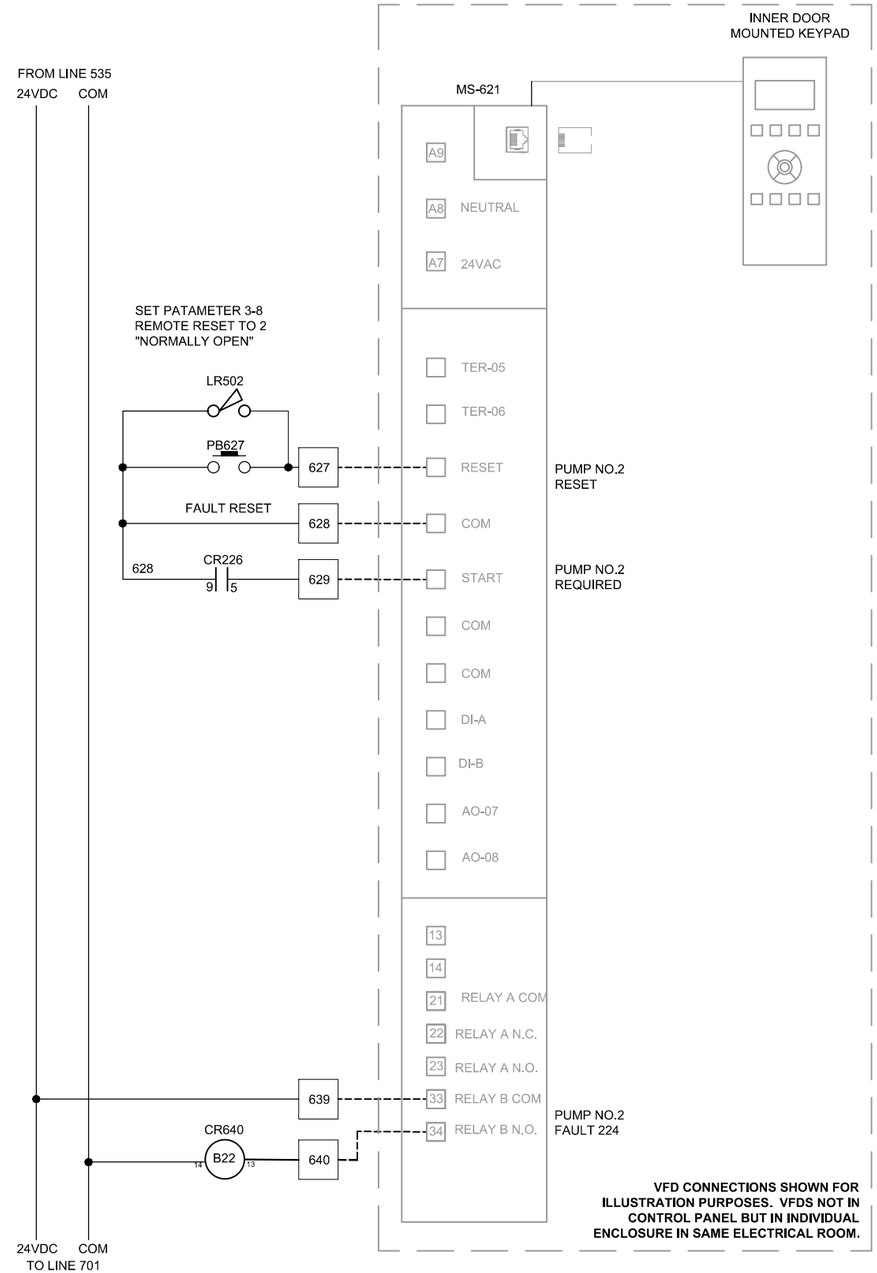

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INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

STARTER CIRCUITS PUMPS 1 & 2

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-10-R0.DWG	

No. : **D - 10**

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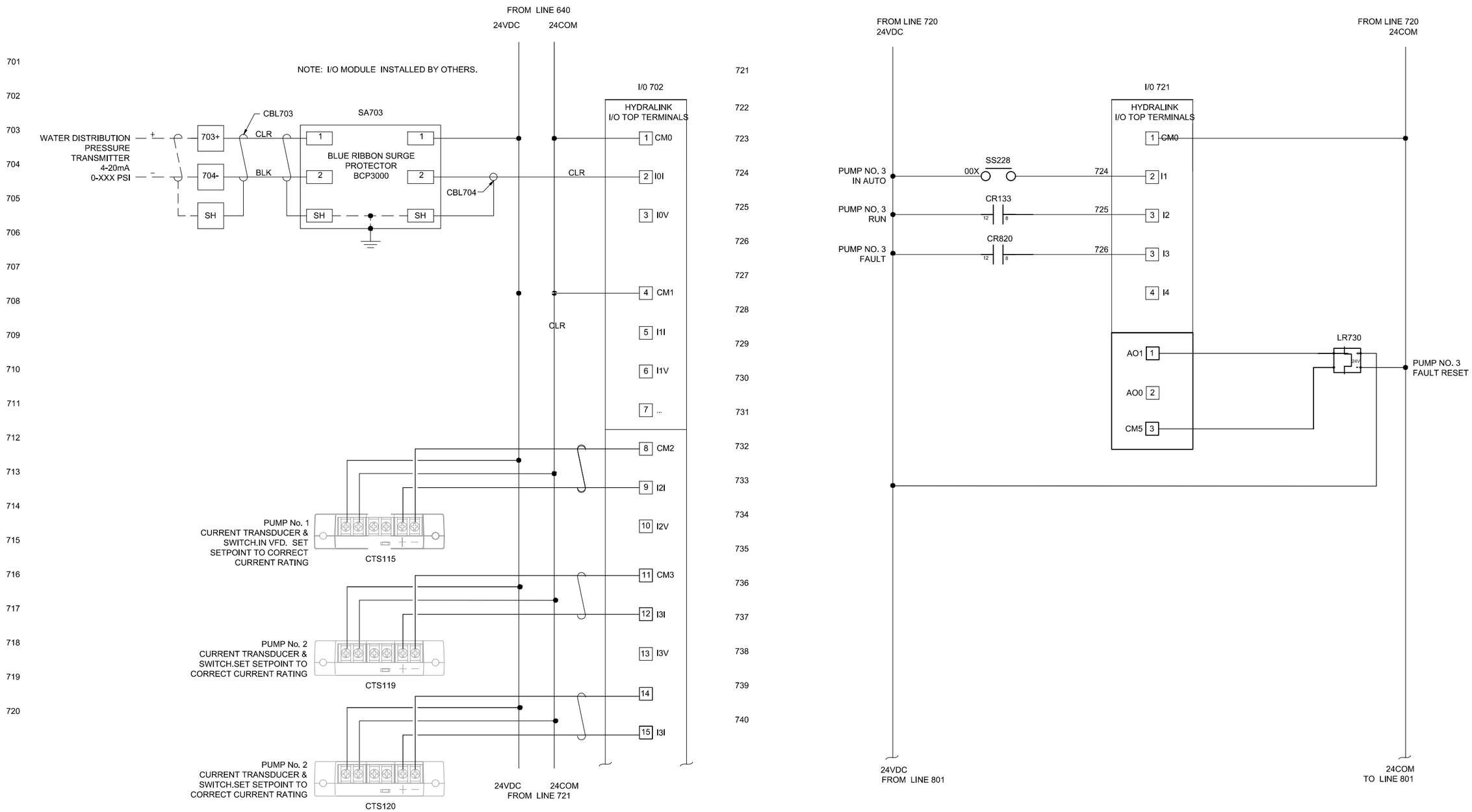

Rev No.	Fecha	Descripcion
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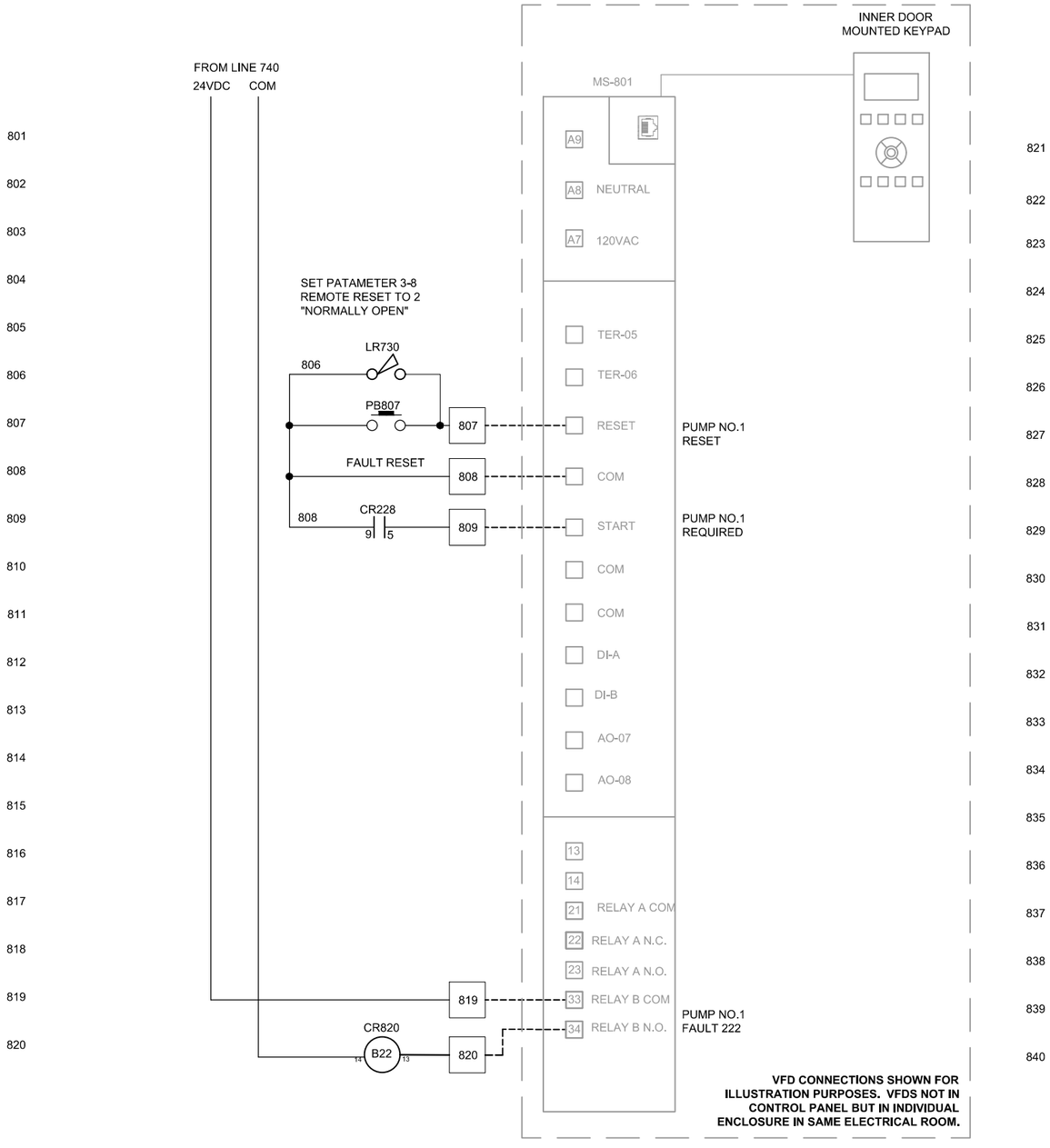
INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

HYDRALINK I/O MODULES

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-11-R0.DWG	

No. : **D - 11**



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Rev No.	Fecha	Descripcion
1	08-24-25	Owner's Comments and Dry Well Float
0	06-17-25	Owner's Review

INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

STARTER CIRCUIT PUMP 3

SCALE : N.T.S	DATE : JUN 2025
APROVADE : M.C.M	No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-12-R0.DWG	

No. :

D - 12

ITEM	TAG	DESCRIPTION	Model	MANUFACTURER
1		ENCLOSURE	ESSS6-483616	SCHAEFERS
2		ENCLOSURE BACK PANEL	ESP4836	SCHAEFERS
3		INNER DOOR SWITCH ASSEMBLY	SPSW3AL-4836	SCHAEFERS
4		DRIP SJIELD KIT	SPDSKSS6-36	SCHAEFERS
5		VENT DRAINS	AVDR4SS4	HOFFMAN
6		VENTILATION HOOD	18102000014	PF ANNENBERG
7		VENTILATION FILTER KIT	11710001050	PF ANNENBERG
8	LA101	SURGE LIGHTING PROTECTION DEVICE	M9L31277	SQUARE D
9	CB102	1-PHASE CIRCUIT BREAKER	M9F4C110	SQUARE D
10	CS104	CURRENT SWITCH	ACS200	ACUAMP
11	VM109	VOLTAGE MONITOR	PC1MDUL	MACROMATIC
12	CTS113	CURRENT TRANSDUCER AND SWITCH	ACTS200	ACUAMP
13	CTS117	CURRENT TRANSDUCER AND SWITCH	ACTS200	ACUAMP
14	CTS120	CURRENT TRANSDUCER AND SWITCH	ACTS200	ACUAMP
15	XFMR122	1500 VA,TRANSFORMER 208/277/380 VAC PRI/115 VAC SEC	PH1000MGJ	HAMMOND POWER SOLUTIONS
16	CB122	MINIATURE CIRCUIT BREAKER 120/240V 15A	QOU115VH	SQUARE D
17	PS126	POWER SUPPLY 100W 24VDC	DRC-100B	MEAN WELL
18	SP128	SUPPLEMENTARY PROTECTOR UL1077 1P 0.5A C CURVE	S201-C0.5	ABB
19	BAT128	BATTERY 12VDC 7.0 AMP HOUR	PS-1270F1	POWER SONIC
20		BATTERY SHELF PS-1270 DOUBLE	SM401	PEERLESS
21	SP131	SUPPLEMENTARY PROTECTOR UL1077 1P 1A C CURVE	S201-C1.0	ABB
22	CR132	CONTROL RELAY 3 POLE 24 VDC WITH INDICATOR	RH3B-ULDC24V & SH3B-05C	IDEC
23	CR133	CONTROL RELAY 2 POLE 24 VDC WITH INDICATOR	RH2B-ULDC24V & SH2B-05C	
24	CR135	CONTROL RELAY 2 POLE 24 VDC WITH INDICATOR	RH2B-ULDC24V & SH2B-05C	IDEC
25	CR137	CONTROL RELAY 2 POLE 24 VDC WITH INDICATOR	RH2B-ULDC24V & SH2B-05C	IDEC
26	CR139	CONTROL RELAY 3 POLE 24 VDC WITH INDICATOR	RH3B-ULDC24V & SH3B-05C	IDEC
27	PL202	INDICATOR LAMP WHITE 120VAC LED	9001KP38LWW9	SQUARE D
28	TR203	00-240VAC 8P (0.1S-600HR) ON + RELAY SOCKET	RTE-B1BAD24+ SR2P-06	IDEC
29	CR205	CONTROL RELAY 1 POLE 24 VDC	RIBU1C	IDEC
30	PL205	ALARM STROBE LIGHT AND MOUNTING BRACKET	105XBRIRGA120A +105BM	EDWARDS
31	CR207	CONTROL RELAY 2 POLE 120 VAC WITH INDICATOR	RH2B-ULDC24V & SH2B-05C	IDEC
32	PB207	PUSHBUTTON	9001KR1B24R	SQUARE D
33	CR208	ENCLOSED RELAY ONE POLE 24VDC	RIBU1C	
34	AH208	ALARM HORN & GASKET	879EX -G1	EDWARDS
35	SS221	THREE POSITION SELECTOR SWITCH	9001KR1BR5	SQUARE D
36	CR222	CONTROL RELAY 1 POLE 120 VAC WITH INDICATOR	RH1B-ULAC120V & SH1B-05C	IDEC
37	SS224	THREE POSITION SELECTOR SWITCH	9001KS43BH2	SQUARE D
38	CR226	CONTROL RELAY 1 POLE 120 VAC WITH INDICATOR	RH1B-ULAC120V & SH1B-05C	IDEC
39	SS227	THREE POSITION SELECTOR SWITCH	9001KS43BH2	SQUARE D
40	CR228	CONTROL RELAY 1 POLE 120 VAC WITH INDICATOR	RH1B-ULAC120V & SH1B-05C	IDEC
41	PL231	INDICATOR LAMP GREEN 120VAC LED	9001KP38LGG9	SQUARE D
42	PL233	INDICATOR LAMP RED 120VAC LED	9001KP38LRR9	SQUARE D
43	PL234	INDICATOR LAMP GREEN 120VAC LED	9001KP38LGG9	SQUARE D
44	PL235	INDICATOR LAMP RED 120VAC LED	9001KP38LRR9	SQUARE D
45	PL238	INDICATOR LAMP GREEN 120VAC LED	9001KP38LGG9	
46	PL239	INDICATOR LAMP RED 120VAC LED	9001KP38LRR9	SQUARE D
47	ISB303	INTRINSICALLY SAFE BARRIER, SINGLE CHANNEL. 4-20MA	2865340	PHOENIX CONTACT
48	SA315	DC SURGE PROTECTOR	BCP3000	BLUE RIBBON
49	ISR322	INTRINSICALLY SAFE BARRIER, DOUBLE CHANNEL. RELAY OUTPUT	2865476	PHOENIX CONTACT
50	CR322	RELAY 2 POLE 120VAC WITH INDICATOR	RH2B-ULAC120V +SH2B-05C	IDEC
51	CR324	RELAY 1 POLE 120VAC WITH INDICATOR	RH1B-ULAC120V +SH2B-05C	IDEC
52	ISR326	INTRINSICALLY SAFE BARRIER, DOUBLE CHANNEL. RELAY OUTPUT	2865476	PHOENIX CONTACT
53		I.S. BARRIER BRACKET PHOENIX 3 DOUBLE CHANNEL ORANGE	SM-606	PEERLESS
54	CR328	RELAY 2 POLE 120VAC WITH INDICATOR	RH2B-ULAC120V +SH2B-05C	IDEC
55	CR330	RELAY 1 POLE 120VAC WITH INDICATOR	RH1B-ULAC120V +SH1B-05C	IDEC
56	ISR331	INTRINSICALLY SAFE BARRIER, DOUBLE CHANNEL. RELAY OUTPUT	2865476	PHOENIX CONTACT

ITEM	TAG	DESCRIPTION	Model	MANUFACTURER
57	CR336	RELAY 2 POLE 120VAC WITH INDICATOR	RH2B-ULAC120V +SH2B-05C	IDEC
58	PB337	PUSHBUTTON	9001KR1BH5	SQUARE D
59	PL337	INDICATOR LAMP WHITE 120VAC LED	9001KP38LWW9	SQUARE D
60	PLC407	CONTROLLER		HYDRALINK (PBO)
61	LR501	LIMIT RELAY	FC-3RLY2	IDEC
62	LR502	LIMIT RELAY	FC-3RLY2	IDEC
63	CR507	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
64		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
65	CR508	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
66		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
67	CR509	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
68		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
69	CR510	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
70		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
71	CR512	RELAY 2 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
72		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
73	CR513	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
74		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
75	CR514	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	IDEC
76		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
77	CR515	RELAY 1 POLE 24VDC WITH INDICATOR	RH1B-ULDDC24V+SH1B05C	
78		DIODE, 1AMP, 50V MAX PEAK REVERSE VLTG	1N4001	QUENCHARC
79	ES521	8 PORT ETHERNET SWITCH	EISK8-GT	SKORPION
80	OIT527	OIT, 7 INCH HMI		HYDRALINK (PBO)
81	CM533	CELLULAR MODEM LTE ETHERNET		HYDRALINK (PBO)
82		CELL MODEM ANTENNA		HYDRALINK (PBO)
83	CR539	RELAY 1 POLE 120VAC WITH INDICATOR	RH1B-ULAC120V +SH1B-05C	
84	CB540	CIRCUIT BREAKER 10A 22KA 120/240V	QOU115VH	SQUARE D
85	RC540	RECEPTACLE 120V 15A GFI	1492-REC15G	ALLEN BRADLEY
86	DS540	INNER DOOR SWITCH ASSEMBLY	ALFSWD	HOFFMAN
87	LT540	PANEL LIGHT LED MAG MOUNT	LEDA1M35	HOFFMAN
88	MS601	VFD WITH BYPASS, FRAME 1 IP20	FC202P45KT4E66HXXNXXXXSXXXXAQBPXXXXD0	DANFOSS
89		REMOTE KEYPAD KIT	LCP-601	DANFOSS
90		MODBUS COMMUNICATION CARD	175G0130	DANFOSS
91	PB607	PUSHBUTTON	9001KR1BH5	SQUARE D
92	CR620	CONTROL RELAY 2 POLE 120 VAC WITH INDICATOR	RH2B-ULDDC24V & SH2B-05C	IDEC
93	MS621	VFD WITH BYPASS, FRAME 1 IP20	FC202P45KT4E66HXXNXXXXSXXXXAQBPXXXXD0	DANFOSS
94		REMOTE KEYPAD KIT	LCP-601	AD
95		MODBUS COMMUNICATION CARD	175G0130	AD
96	PB627	PUSHBUTTON	9001KR1BH5	SQUARE D
97	CR640	CONTROL RELAY 2 POLE 120 VAC WITH INDICATOR	RH2B-ULDDC24V & SH2B-05C	IDEC
98	I/O702	PLC I/O MODULE		HYDRALINK (PBO)
99	SA703	DC SURGE PROTECTOR	BCP3000	BLUE RIBBON
100	SA708	DC SURGE PROTECTOR	BCP3000	BLUE RIBBON
101	I/O721	PLC I/O MODULE		HYDRALINK (PBO)
102	LR730	LIMIT RELAY	FC-3RLY2	IDEC
103	MS801	VFD WITH BYPASS, FRAME 1 IP20	FC202P45KT4E66HXXNXXXXSXXXXAQBPXXXXD0	DANFOSS
104		REMOTE KEYPAD KIT	LCP-601	DANFOSS
105		MODBUS COMMUNICATION CARD	175G0130	DANFOSS
106	PB807	PUSHBUTTON	9001KR1BH5	SQUARE D
107	CR820	CONTROL RELAY 2 POLE 120 VAC WITH INDICATOR	RH2B-ULDDC24V & SH2B-05C	IDEC
108		GROUND BUS	ECGB5	SIEMENS
109		TERMINAL BLOCK UT4	3044364	PHOENIX CONTACT
110		UT 4-TWIN-PE	3044380	PHOENIX CONTACT
111		TERMINAL BLOCK END COVER	D-UT 2,5/4-TWIN	PHOENIX CONTACT
112		TERMINAL BLOCK END CLAMP	800886	PHOENIX CONTACT

Rev No.	Fecha	Descripcion
1	08-24-25	Owner's Comments and Dry Well Float
0	06-17-25	Owner's Review

INGEMEL S.A.
ENGINEERING COMPANY

LIFT STATION 4
SUBMERSIBLE PUMPS CONTROL PANEL
CITY OF PEMBROKE PINES

BILL OF MATERIALS

SCALE : N.T.S
DATE : JUN 2025
APROVADE : M.C.M
No. PROJECT : 23-108
DRAWING No. : 23-108-BMS-13-R0.DWG

No. : **D - 13**

CITY OF PEMBROKE PINES

Utility Department
8300 South Palm Drive
Pembroke Pines, FL 33025

The City Of
PEMBROKE PINES
Florida

PROJECT MANUAL

Master Lift Station #4
Pump, Motor and Control Panel Replacement

October, 2025

TABLE OF CONTENTS

CITY OF PEMBROKE PINES

MASTER LIFT STATION #4

PROJECT MANUAL

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes general descriptions of the Contractor use of site, location of work, description of work, work sequence, owner occupancy and work by others.

1.02 RELATED SECTIONS

A. Section 01015 - General Requirements

B. Section 01025 - Measurement and Payment

C. Section 01030 - Special Project Procedures

D. Section 01505 - Control of Work

1.03 REFERENCES (NOT USED)

1.04 CONTRACTOR USE OF SITE

A. The Contractor shall limit his area of work to remain within those properties and easements as depicted in the Drawings or as approved in writing by the Owner.

B. Contractors' use of lands other than those depicted in the Drawings shall require written approval from the land owner and be at the Contractors risk and cost.

1.05 LOCATION OF WORK

A. The work is located at Master Lift Station #4 in the southeast corner of Washington Street and Southwest 114th Avenue in the City of Pembroke Pines, Florida.

1.06 DESCRIPTION OF WORK

A. Master Lift Station #4 (MLS#4) Pump, Motor and Control Panel Replacement:

1. Removal of three, existing 30 HP submersible pump and motor assemblies in the existing MLS#4 dry pit.
2. Installation of three, new 60 HP submersible pump and motor assemblies in the existing MLS#4 dry pit.
3. Demolition of existing conduit, wiring, disconnects and control panels servicing the three existing 30 HP pumps.
4. Installation of new conduit, wiring, disconnects and control panels servicing the three new 60 HP pumps.
5. New pumps shall be installed in the same dimensional configuration as not to require any change to existing valves and fittings.
6. Provide temporary pumping facilities to support construction activities.
7. Conduct startup operations and testing to ensure proper system functionality.

1.07 WORK SEQUENCE

A. Install temporary bypass pumps to maintain system operation during construction.

B. Remove three, existing 30 HP submersible pump and motor assemblies in the existing MLS#4 dry pit.

C. Demolition of existing conduit, wiring, disconnects and control panels servicing the three existing 30 HP pumps.

D. Installation of new conduit, wiring, disconnects and control panels servicing the three new 60 HP pumps.

E. Installation of three, new 60 HP submersible pump and motor assemblies in the existing MLS#4 dry pit.

F. Conduct startup operations and testing to ensure proper system functionality.

G. Remove the temporary bypass pumps after successful testing.

1.08 OWNER OCCUPANCY

A. Cooperate with Owner to minimize conflict, and to Owner's operations.

B. Schedule the Work to accommodate this requirement.

1.09 WORK BY OTHERS

A. The Contractor is advised that work by others may take place during the duration of the contract time. It shall be the Contractor's responsibility to coordinate and schedule all Work as not to delay or hinder his work or the work by others.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01015

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for miscellaneous provisions applicable to the Work.

1.02 RELATED SECTIONS

A. Section 01030 – Special Project Procedures

B. Section 01090 - References

C. Section 01310 – Construction Schedules

D. Section 01340 – Shop Drawings, Working Drawings and Samples

E. Section 01530 – Protection of Existing Property

F. Section 01570 – Traffic Regulation

G. Section 01670 – Testing Piping Systems

H. Section 01720 – Project Record Documents

I. Other Sections as applicable.

1.03 TERMINOLOGY

A. Throughout the Contract Documents, the following definitions apply:

1. Owner- The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

2. 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.

1.04 SAFETY

A. All work shall be done in a safe manner and in strict compliance with all requirements of the Federal Occupational Safety and Health Act (OSHA), The Florida Trench Safety Act and all other State and local safety and health regulations.

B. The Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due. Failure of the Owner to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibilities.

C. The Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights for the protection of the public in accordance with Section 01570 – Traffic Regulation.

1.05 APPLICABLE CODES

A. The Contractor shall comply with the applicable standards codes and specifications governing the Contract Documents whether City, County, State or Federal. The Contractor is obligated to notify the Owner and Engineer of any deficiency contained in the Contract Documents immediately upon discovery. Where conflicts exist in such, the more stringent shall govern.

1.06 APPLICABLE PERMITS AND LICENSES

A. The Contractor shall abide by all permit conditions, whether, general, specific, limited or otherwise. A copy of all applicable permits and licenses, with the exception of City permits obtained by the Contractor, are attached hereto and made a part of the Contract Documents.

B. The Contractor shall apply for and obtain all Building Department permits required for this project, including but not limited to, electrical and structural.

1.07 PUBLIC BID DISCLOSURE ACT 218.80 FS

A. All the local governmental entity permits or fees are to be disclosed, including, but not limited to, all license fees, permit fees, impact fees, or inspection fees, payable by the contractor to the unit of government that issued the bidding documents or other governmental agency,

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION RESPONSIBILITIES

A. Upon receipt of the Notice To Proceed, the Contractor shall arrange for a Pre-Construction meeting. The meeting shall be held with a minimum of one weeks' notice and shall include the Engineer, the Owner, and Representatives for all affected utility companies.

3.02 TEMPORARY UTILITIES

A. The Contractor shall be responsible to arrange for and supply all temporary utilities including, but not limited to, water, sewer, and electricity.

B. The cost of temporary utilities shall be considered incidental to the cost of the Work and is therefore included in the Bid.

3.03 UNDERGROUND LOCATING SERVICE

A. Prior to underground construction, the Contractor is required by the Underground Facility Damage Prevention and Safety Act, Chapter 556 FS to contact Sunshine 811, for the location of underground utilities.

3.04 HURRICANE PREPAREDNESS PLAN

A. Should the Performance of the work occur during Hurricane Season, within thirty days of the date of Notice to Proceed, the Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan. The Plan should outline the necessary measures that the contractor proposes to perform at no additional cost to the owner in case of a hurricane warning. The plan shall detail these measures with specific action items defining responsible personnel.

3.05 INCLEMENT WEATHER

A. In the event of inclement weather, or whenever Engineer shall direct; Contractor will cause Subcontractors to carefully protect the work and materials against damage or injury from the weather. If in the opinion of the Engineer, any portion of Work or materials shall have been damaged or injured by reason of failure on the part of Contractor or any Subcontractor to so protect the Work, such Work and materials shall be removed and replaced at the expense of the Contractor.

3.06 ADVANCE INVESTIGATIONS

A. The Contractor shall be responsible for uncovering and exposing existing utilities sufficiently in advance of pipe laying operations to confirm elevation, size, material and clearance separation(s). If, upon excavation, an existing utility is found to be in conflict with the proposed construction or be of a size or material different from what is shown on the plans, the Contractor shall immediately notify the Engineer, who will in turn prepare a recommendation. Failure of the Contractor to perform advance investigations shall not relieve it of any claims for delay or damages.

3.07 PRESERVATION AND RESTORATION

A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this project. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

3.08 PROTECTION OF WORK AND MATERIAL

A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.

B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the CITY.

3.09 CONTRACTOR USE OF PREMISES

A. Contractor shall have limited use of the premises for construction operations, including limited use of the site. The Contractor's use of the premises is further limited to the Owner's right to perform construction operations with its own forces or to employ separate Contractors on portions of the project.

B. The Contractor shall be responsible for coordinating his daily activities in conjunction with any Contractors presently working within the vicinity of this project.

C. Confine operations to areas within rights-of-way and easements.

D. Keep existing driveways and entrances serving the premises clear and available to the Owner, Residents and the Owner's employees at all times.

1. Do not use these areas for parking or storage of materials.

2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

3.10 DISPOSAL

A. Do not dispose of any unsuitable fill, hazardous or organic material onsite. All such material shall be disposed of in a legal manner by the Contractor, the cost of which shall be included in the Bid.

3.11 ENVIRONMENTAL PROTECTION

A. Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.

3.12 MATERIAL AND EQUIPMENT

A. Substitutions: After Bidding period, up to 30 days after date of Notice to Proceed, the Engineer will consider written requests from Contractor for proposed substitutions of products. Subsequent requests will be considered only in case of product unavailability or other condition beyond control of the Contractor. Submit a separate request for each proposed substitution;

1. Do not order or install substitute products without written acceptance from the Engineer of Record.

2. Do not imply or indicate substitutions on shop drawings or product data submittals without a separate formal request.

3. Engineer will determine acceptability of substitution.

4. Only one request for substitution for each product will be considered. If not accepted, Contractor shall provide specified product.

B. Product selection is governed by the Contract Documents and governing regulations, not by previous project experience.

1. Where a single or multiple products or manufacturers are named, provide one of the products indicated or submit a request for substitution for any product or manufacturer not named unless no substitution is permitted.

2. Where the Specifications only require compliance with performance requirements, an imposed code, standard or regulation, select a product that complies with the requirements, standards, codes or regulations specified.

3. Manufacturers named in a Specification section are those manufacturers considered capable of manufacturing products conforming to the specified requirements. The naming of a particular manufacturer does not imply acceptance or approval of just any standard product of that manufacturer.

3.13 ADJUSTMENT OF EXISTING UTILITIES

A. The Contractor shall raise or lower all manholes, valve boxes, etc. to finished grade. The cost of these adjustments shall be considered incidental to the cost of the Work and is therefore included in the Bid.

3.14 EXISTING IRRIGATION

A. All existing irrigation systems within the area of the Work shall be restored to original condition or better and adjusted to finished grade. The cost of repairs and/or adjustment to existing irrigation shall be considered incidental to the cost of the Work and is therefore included in the Bid.

3.15 DEWATERING

A. In accordance with SFWMD criteria contained in 40E-2.061 F.A.C., a dewatering permit is not required provided the following provisions are met:

1. Maximum daily pumpage is less than 5 million gallons (MG) and a maximum total project pumpage of less than 100 MG over a one year period;

2. All discharge shall remain on the project site;

3. No dewatering shall occur to a depth below elevation 0.0 feet NGVD within 1,000 feet of saline water, except when dewatering water with a chloride concentration of greater than 1,000 milligrams per liter;

4. No dewatering shall occur within 100 feet of a wastewater treatment plant rapid-rate land application system permitted under Part IV of Chapter 62-610, F.A.C.;

5. No dewatering shall occur within 1,000 feet of a known landfill or contamination; and,

6. No dewatering shall occur within 1,000 feet of a freshwater wetland unless dewatering activities are completed within 60 days.

7. All dewatering operations are subject to the Permit Conditions in Section 5.0 of the SFWMD APPLICANT'S HANDBOOK FOR WATER USE PERMIT APPLICATIONS (07-16-2014), including responsibility for mitigating any harm that may occur as a result of the dewatering to existing legal uses, off-site land uses, or natural resources.

B. The Contractor shall apply for a dewatering permit through the SFWMD if any of the above conditions cannot be met.

3.16 DEMOLITION

A. Limits of demolition which may be shown in the Contract Documents are general in nature. Actual limits of demolition shall be as determined by the field conditions in conformance with the requirements of the Work.

B. All sidewalks within the limits of construction which are not ADA compliant (cross-slopes which exceed 2% and/or running slopes which exceed 5% and/or changes in level of ¼" or greater) shall be demolished and reconstructed to meet these requirements.

C. When sidewalk tie-ins exist outside the limits of construction which are not ADA compliant, the Contractor shall replace those sections as directed by the Owner.

D. Conduct demolition to minimize interference with adjacent structures.

1. Provide bracing and shoring as required.

2. Provide Professional Engineering services as necessary to ensure adequate protection.

E. Provide, erect, and maintain barrier with adjacent structures.

F. Conduct operations with minimum interference to public or private thoroughfares. Maintain egress and access at all times.

G. Do not close or obstruct roadways without permits.

H. Disconnect electrical feeders and circuits at the source, remove related wiring and label circuit breakers and starters as spare and salvage to Owner.

I. Mark location of disconnected utilities. Identify utilities and indicate capping locations on Project Record Documents.

J. Allow Owner to salvage equipment as needed.

K. Demolish the indicated structures and appurtenances in an orderly and careful manner.

L. Cease operations and notify Engineer immediately if adjacent structures appear to be endangered. Do not resume operations until corrective measures have been taken.

M. Except where noted otherwise, immediately remove demolished material from site.

N. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect under provisions of Section 01600.

O. Pump out tanks located within demolition area. Remove underground tanks, components, and piping from site.

P. Remove and promptly dispose of any contaminated, chemicals or dangerous materials encountered properly and at no cost to the Owner.

Q. Do not burn or bury materials on site.

R. Remove foundation walls and footing completely.

S. Remove concrete slabs on grade. Break up concrete slabs on grade to permit drainage.

T. Keep work sprinkled to minimize dust if necessary. Provide hoses and water main or hydrant connections for this purpose.

U. Backfill areas excavated caused as a result of demolition. Use clean sandy earth materials.

V. Rough grade and compact areas affected by demolition to maintain site grades and contours.

W. Remove demolished materials from site as work progresses. Leave site in clean condition.

X. All waste material shall be removed from the plant site. The contractor shall be responsible for the ultimate disposal of all items required to be removed and shall obtain all necessary permits for removal and disposal of the waste material.

Y. The contractor shall dispose of all fuel and waste sludge, if any, encountered or developed during the demolition operations in an approved manner.

END OF SECTION

SECTION 01021

OWNER CONTINGECY ALLOWANCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for administrative procedures for the Contractors utilization of monetary amounts for Owner contingency allowances when contained in the Contract Sum or Total Base Bid.

B. The Contractor has included in the Contract Price all Allowances so named in the Contract Documents and Shall cause the Works so covered to be performed for such sums and by such person or entities as may be acceptable to Owner and Engineer.

C. The contractor agrees that an Allowance, if any, is for the sole use of Owner to cover unanticipated or undetermined costs.

D. All owner Allowances which remain unused, in whole or in part, remain the property of the Owner.

1.02 RELATED SECTIONS

A. Section 00310 - Bid Form.

B. Section 01025 – Measurement and Payment.

C. Section 01152 – Application for Payment

D. Section 01310 - Construction Schedules.

E. Section 03740 - Repair of Damaged Concrete

F. Other Sections as Applicable.

1.03 SCHEDULE OF ALLOWANCES

A. Refer to Bid Form.

1.04 PROCEDURES FOR ADMINISTRATION OF ALLOWANCES.

A. Funds will only be drawn from Owner contingency allowances by Change Order.

B. Costs shall be as represented in the Schedule of Values.

C. Payment shall be as represented in Section 01025 – Measurement for Payment.

1.05 COST INCLUDED IN PERMITTING ALLOWANCES

A. Cost of the permit application fee determined by the agency at the time of the Contractor's submittal. All other costs associated with obtaining the required permits shall be the responsibility of the Contractor.

1.06 COSTS INCLUDED IN ALLOWANCES

A. Cost of product to Contractor, less applicable trade discounts.

B. Delivery to site, products handling at site, including unloading, uncrating, and storage.

C. Applicable taxes unless covered by Owner Furnished Equipment clause.

D. Protection of products from elements and from damage.

E. Labor, insurance, payroll, bonding, equipment rental and installation and finishing, except when installation is specified as part of allowance.

F. Other expenses required to complete installation.

G. Contractor field and home office overhead and profit.

1.07 CONTRACTOR RESPONSIBILITIES

A. Promptly notify Engineer of any reasonable objections from supplier.

B. On notification of selection, execute purchase agreement with designated supplier.

C. Arrange for process shop drawings, product data, and samples.

D. Arrange for delivery. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

E. Install, adjust, and finish products.

F. Provide warranties for products and installation.

1.08 CORRELATION WITH CONTRACTOR SUBMITTALS

A. Schedule shop drawings, product data, samples, and delivery dates, in Progress Schedule for products selected under allowances.

1.09 PRODUCTS (NOT USED)

1.10 EXECUTION (NOT USED)

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT – LUMP SUM BID

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section includes administrative and procedural requirements for determining Work completed under a Lump Sum format bid.

1.02 RELATED SECTIONS

A. Section 01152 – Applications for Payment

B. Section 01370 – Schedule of Values

C. Other Sections as applicable.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

B. Occupational Safety and Health Act (OSHA)

C. American Society of Mechanical Engineers (ASME)

D. American Institute of Steel Construction (AISC)

E. American Waterworks Association (AWWA)

F. American Welding Society (AWS)

G. Underwriters Laboratories (UL)

H. National Electric Code (NEC)

I. Steel Structures Painting Council (SSPC)

1.04 GENERAL REQUIREMENTS

A. Prices shall include all costs required for the completed, in-place construction of the specified unit of work. This may include but not be limited to, materials and delivery; cost of installation; incidentals; labor including social security, insurance, and other required fringe benefits; workman's compensation insurance; bond premiums; rental of equipment and machinery; taxes; testing; surveys; incidental expenses; and supervision.

B. Installation, acceptance and payment shall be in accordance with the REFERENCE STANDARDS.

C. The Owner reserves the right to reject the Contractor's measurement of completed work that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

D. Contract Sum adjustments will be by Change Order on basis of net accumulative change for each unit price category.

E. Except as otherwise specified, unit prices shall apply to both deductive and additive variations of quantities.

F. Lump sum and unit prices in the Schedule of Values shall remain in effect until date of final completion of the entire Work.

G. Partial payment for material and equipment properly stored and protected will be made in accordance with requirements of the General Conditions.

H. No separate payment will be made for Record Drawings.

I. Abbreviations:

1. Acre - AC
2. Allowance - AL
3. Cubic Yard - CY
4. Each - EA
5. Furnish and Install - F & I
6. Gallons - GA
7. Gross Mile - GM
8. Linear Feet – LF
9. Lump Sum - LS
10. Million Gallons – MG
11. Net Mile - NM
12. Square Foot – SF
13. Square Yard – SY
14. Ton - TN

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 MEASUREMENT AND PAYMENT

A. Payment shall constitute full compensation and will be made as indicated in the RELATED SECTIONS.

B. The Contractor shall submit a Schedule of Values for Engineer approval in accordance with Section 01370 within 14 days of the effective date of the Agreement.

1. The Schedule of Values shall include individual Pay Item prices for each component in the Contract Documents as summarized in the Lump Sum Bid.
2. The quantity and detail of Pay Items shall be as required by the Owner.
3. Individual pay item prices may be Lump Sum or Measured quantities for each pay item broken down from the Lump Sum Bid, subject to approval by the Owner.
4. The Pay Item for Mobilization and De-Mobilization shall not exceed five (5) percent of the Lump Sum Bid.

C. The quantity approved for payment shall be either:

1. Percentage of the Pay Item price - A percentage of the pay item price equivalent to the percentage of the project completion as determined by the Engineer as of the date of the pay request submitted. The percent

completion of the project shall be based on the percent of the total project actually constructed and not on the percent of the Contract price completed.

2. Measured Quantities - The actual quantities in-place and accepted as measured by the Engineer on the date of the pay request submitted in the units specified in the schedule of values.

3.02 PROTECTION

A. Where pavement, pipes, valves, appurtenances, trees, shrubbery, fences, other property, or structures are in proximity to the WORK, adequate protection shall be provided. Such protection is considered incidental to construction and shall not be assigned to any pay item.

3.03 RESTORATION

A. Where pavement, pipes, valves, structures, appurtenances, trees, shrubbery, fences, other property or structures not designated as pay items, have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the Contract Documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before work began within a time frame approved by the Engineer. Such restoration is considered incidental to construction and shall not be assigned to any pay item.

END OF SECTION

SECTION 01050

FIELD ENGINEERING AND SURVEYING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide and pay for field engineering and surveying services required for Project as follows:

1. Surveying work required for the lay-out and execution of Work.

2. Surveying work required to identify and maintain existing control points, bench marks and property line corners.

3. Surveying work required to verify existing utility locations.

4. Surveying work as required to create Project Record Documents.

5. Civil, structural, or other professional engineering services specified, or required to execute the Contractor's construction methods.

6. Testing, sampling, calibrating and training services specified, or required to execute the Contractor’s construction methods including soils, concrete, material, etc.

1.02 RELATED SECTIONS

A. Section 01410 – Materials and Installation Testing

B. Section 01720 - Project Record Documents

C. Other Sections as applicable.

1.03 QUALIFICATIONS OF PROFESSIONAL

A. Florida Registered Professional Surveyor and Mapper, acceptable to the Owner and the Engineer.

B. Florida Registered Professional Engineer(s) of the specialty required for on the Project, acceptable to the Owner and the Engineer.

1.04 SURVEY REFERENCE POINTS

A. Horizontal and vertical control points for the Project are to be established by the Engineer and provided to the Contractor.

B. Locate and protect control points prior to starting work, and preserve all permanent reference points during construction.

1. Make no changes or relocations without prior written notice to the Engineer.

2. Report to the Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

3. Require surveyor to replace project control points which may be lost or destroyed.

a. Establish replacements based on original survey control.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two temporary bench marks on site, referenced to data by survey control points.

1. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site Improvements

a. Line and grade of pipe and structure installation; top of pipe, invert, slope, etc.

b. Grading for fill and topsoil placement, roadway sub-base and base installation.

2. Controlling lines and levels required for all trades.

C. From time to time, verify layouts by same methods.

1.06 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses in accordance with Section 01720.

1.07 SUBMITTALS

A. Submit name and address of Professional Surveyor and Mapper or Professional Engineer to the Engineer.

B. On request of the Engineer, submit documentation to verify accuracy of field engineering work.

C. Submit certificate signed by registered surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

D. Submit Project Record Documents in accordance with Section 01720.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 ADVANCE INVESTIGATIONS

A. The Contractor shall be responsible for uncovering and exposing existing utilities sufficiently in advance of pipe laying operations to confirm elevation, size, material and clearance separation(s). If, upon excavation, an existing utility is found to be in conflict with the proposed construction or be of a size or material different from what is shown on the plans, the Contractor shall immediately notify the Engineer, who will in turn prepare a recommendation. Failure of the Contractor to perform the advance investigation shall not relieve it of any claims for delay or damages.

END OF SECTION

SECTION 01090

REFERENCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Applicable Publications: Whenever in these specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the drawings shall be waived because of any provision of, or omission from, said standards or requirements.

B. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These assignments shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. The final responsibility for fulfillment of the entire set of contract requirements remains with the CONTRACTOR.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the specifications, all work specified herein shall conform to or exceed the requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications nor the applicable codes.

B. References herein to "Building Code" or “Code” shall mean the Florida Building Code. The latest edition of the code as approved and used at the local agency having jurisdiction, shall apply to the WORK herein, including, all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflicts between codes, reference standards, drawings and other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER for clarifications and directions prior to ordering or providing any materials or labor. The CONTRACTOR shall bid the most stringent requirements.

D. Applicable Standard Specifications: The CONTRACTOR shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portion of those referenced codes, standards, and specifications listed herein; except, that wherever references to "Standard Specifications" are made, the provisions therein for measurement and payment shall not apply.

E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations, including all changes and amendments thereto.

F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.03 TRADE NAMES AND ALTERNATIVES

A. For convenience in designation in the Contract Documents, materials to be incorporated in the WORK may be designated under a trade name or the name of a manufacturer and its catalog information. The use of alternative material which is equal in quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

1. The burden of proof as to the quality and suitability of such alternative equipment, products, or other materials shall be upon the CONTRACTOR.

2. The ENGINEER will be the sole judge as to the comparative quality and suitability of such alternative equipment, products, or other materials and its decisions shall be final.

3. Base Bid requirements outlined in the Supplement to Bid Form, shall supersede any language contained hereinafter.

B. Whenever in the Contract Documents the name or the name and address of the manufacturer or distributor is given for a product or other material, or if any other source of a product or material is indicated therefore, such information is given for the convenience of the CONTRACTOR only, and no limit, restriction, or direction is indicated or intended thereby, nor is the accuracy or reliability of such information guaranteed. It shall be the responsibility of the CONTRACTOR to determine the accurate identity and location of any such manufacturer, distributor, or other source of any product or material called for in the Contract Documents.

C. The CONTRACTOR may offer any material, process, or equipment which it considers equivalent to that indicated. Unless otherwise authorized in writing by the ENGINEER, the substantiation of offers of equivalency must be submitted within 30 days after execution of the Agreement. The CONTRACTOR, at its sole expense, shall furnish data concerning items it has offered as equivalent to those specified. The CONTRACTOR shall have the material as required by the ENGINEER to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the items will fulfill its intended function. Installation and use of a substitute item shall not be made until accepted by the ENGINEER. If a substitute offered by the CONTRACTOR is found to be not equal to the specified material, the CONTRACTOR shall furnish and install the specified material.

D. The CONTRACTOR'S attention is further directed to the requirement that failure to submit data substantiating a request for the substitution of an "or equal" item within said 30-day period after the execution of the Agreement, shall be deemed to mean that the CONTRACTOR intends to furnish one of the specific brand-named products named in the specification, and the CONTRACTOR does hereby waive all rights to offer or use substitute products in each such case. Wherever a proposed substitute product has not been submitted within said 30-day period, or wherever the submission of a proposed substitute product fails to meet the requirements of the specifications and an acceptable resubmittal is not received by the ENGINEER within said 30-day period, the CONTRACTOR shall furnish only one of the products originally-named in the Contract Documents.

1.04 ABBREVIATION

A. Wherever in these specifications references are made to the standards, specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronyms or abbreviation only. As a guide to the user of these specifications, the following acronyms and abbreviations which may appear in these specifications shall have the meanings indicated herein.

1.05 ABBREVIATIONS AND ACRONYMS

A. Abbreviations and acronyms contained in the Contract Documents may include, but not be limited to, the following:

AAMA	Architectural Aluminum Manufacturer's Association
AAR	Association of American Railroads
AASHTO	American Association of the State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
ACPPA	American Concrete Pressure Pipe Association
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturer's Association
AHAM	Association of Home Appliance Manufacturers
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Movement and Control Association
ANS	American Nuclear Society
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASA	Acoustical Society of America
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials and Code Administrators International
BHMA	Builders Hardware Manufacturers Association

CBM	Certified Ballast Manufacturers
CEMA	Conveyors Equipment Manufacturers Association
CGA	Compressed Gas Association
CLPCA	California Lathing and Plastering Contractors Association
CLFMI	Chain Link Fence Manufacturers Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DCDMA	Diamond Core Drill Manufacturers Association
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
HI	Hydraulic Institute
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IME	Institute of Makers of Explosives
IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MBMA	Metal Building Manufacturers Association
MPTA	Mechanical Power Transmission Association
MTI	Marine Testing Institute
NAAM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NGLI	National Grease Lubricating Institute
NMA	National Microfilm Association
NRCA	National Roofing Contractors Association
NWMA	National Woodwork Manufacturers Association
NWWA	National Water Well Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast Concrete Institute
PDI	Plumbing and Drainage Institute
RIS	Redwood Inspection Service
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturers Association
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Makers Association
SBC	Southern Building Code Congress International, Inc. (SBCCI)
SIS	Swedish Standards Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association

SPR	Simplified Practice Recommendation
SSBC	Southern Standard Building Code, Southern Building Code Congress
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
USGS	United States Geological Survey
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WIC	Woodwork Institute of California
WPCF	Water Pollution Control Federation
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Agreement between Owner and Contractor and the Contract Documents.

1.02 RELATED SECTIONS

A. Section 01050 - Field Engineering

B. Section 01310 - Construction Schedules

C. Section 01370 - Schedule of Values

D. Section 01380 - Construction Photographs

E. Section 01700 - Contract Close Out

F. Section 01720 - Project Record Documents

1.03 FORMAT AND DATA REQUIRED

A. Submit applications typed on forms provided by the Owner (or forms provided by Contractor and agreed to by Owner), Application for Payment, with itemized data typed on 8 1/2 inch x 14 inch white paper and continuation sheets.

B. Payment forms shall show significant detail to substantiate request. Additional detail may be required by the Engineer.

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.

3. Execute certification with signature of a responsible officer of Contract firm.

B. Continuation Sheets:

1. Fill in total list of scheduled component items of work, with item number and scheduled dollar value for each item.

2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.

a. Round off values to nearest dollar, or as specified.

3. List each Change Order Number, and description, as for an original component item or work.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project
2. Application number and date
3. Detailed list of enclosures
4. For stored products:
    a. Item number and identification as shown on application.
    b. Description of specific material.
    c. Copy of material invoice.
    d. Address of location where item is stored
    e. Photographs of item (if requested)

B. Submit one copy of data cover letter for each copy of application.

C. As a prerequisite for payment, Contractor is to submit the following:
1. a "Surety Acknowledgment of Payment Request" letter showing amount of progress payment which the Contractor is requesting,
2. updated record drawings for review by the Engineer,
3. updated construction schedule for review by the Engineer,
4. construction photographs.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified for progress payments.

B. Provide FINAL COMPLETION documentation for the final statement of accounting as specified in Section 01700 - Contract Closeout.

C. Submit final record drawings.

1.07 SUBMITTAL PROCEDURE

A. Submit Applications for Payment to the Engineer at the times stipulated in the Agreement.

B. Number: Five copies of each Application.

C. When the Engineer finds Application properly completed and correct, he will transmit certificate of payment to Owner, with copy to Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Engineer shall schedule and administer preconstruction meetings, periodic progress meetings, and specially called meetings throughout the progress of work. The Engineer shall:

1. Prepare agenda for meetings.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record in writing the minutes; include significant proceedings and decisions.
5. Record the meeting with an audio recording device.
6. Reproduce and distribute copies of minutes within five working days after each meeting:
    a. To participants in the meeting.
    b. To parties affected by decisions made at the meeting.

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 meetings to ascertain that work is executed consistent with Contract Documents and construction schedules.

1.02 RELATED SECTIONS

A. Section 01310 - Construction Schedules.

B. Section 01340 - Shop Drawings, Working Drawings, and Samples.

C. Section 01720 - Project Record Documents.

D. Other Sections as applicable.

1.03 PRECONSTRUCTION MEETING

A. Schedule a preconstruction meeting no later than 15 days after date of Notice to Proceed.

B. Location: A central site, convenient for all parties designated by the Owner.

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 Schedule.
2. Critical work sequencing/critical path scheduling.
3. Major equipment deliveries and priorities.
4. Project Coordination.
   a. Designation of responsible personnel.
5. Procedures and processing of:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change Orders.
   e. Applications for Payments.
6. Adequacy of Distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of Premises:
   a. Office, Work and Storage Areas.
   b. Owner's Requirements.
9. Construction facilities, controls and construction aids.
10. Temporary Utilities.

1.04 PROGRESS MEETINGS

A. Schedule regular periodic meetings. The progress meetings will be held as required by progress of the work.

B. Hold called meetings as required by progress of the work.

C. Location of the meetings: Project field office of the Contractor or Engineer.

D. Attendance:

1. Engineer, and his professional consultants as needed.
2. Subcontractors as appropriate to the 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 and conflicts.
4. Problems which impede Construction Schedule.
5. Review of off site fabrication, delivery schedule.
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 a completion date.
    b. Effect on other contracts of the Project.
14. Other business.
15. Construction schedule.
16. Critical/long lead items.

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 work, etc.

G. The Contractor is to provide a current submittal log at each progress meeting in accordance with Section 01340.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Promptly after Award of the Contract and within ten days after the effective date of the Agreement, prepare and submit to the Engineer a Critical Path Method (CPM) construction schedule for the work, with sub-schedules of related activities which are essential to its progress.

B. Submit revised progress schedules on a monthly basis.

C. No partial payments shall be approved by the Engineer until there is an approved up to date construction progress schedule on hand.

D. The Contractor shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the Contractor shall have direct project control and complete authority to act on behalf of the Contractor's schedule.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work

B. Section 01152 - Applications for Payment

C. Section 01200 - Project Meetings

D. Section 01340 - Shop Drawings, Working Drawings and Samples

E. Other Sections as applicable.

1.03 FORM OF SCHEDULES

A. Prepare schedules for submittal each month with pay request. The form of the schedule is to be Microsoft Project or approved equal. The Schedule is to indicate work completed to date and additions to or deletions from the schedule.

1. Provide separate horizontal bar for each trade or operation within each structure or item.

2. Horizontal time scale: In weeks from start of construction and identify the first work day of each month.

3. Scale and spacing: To allow space for notations and future revisions.

B. Format of listings: The chronological order of the start of each item of work for each structure.

C. Identification of listings: By major specification section numbers as applicable and structure.

1.04 CONTENT OF SCHEDULES

A. Construction Progress Schedule:

1. Show the complete sequence of construction by activity.

2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two week increment scale. Specifically list, but not limited to:

a. Receiving Materials

b. Pipeline Installations

c. Testing

d. Restoration

e. Startup

f. Record Drawings

g. Permit Close-out

h. Punch List

i. Owner Activities, Including Inspections

1. Show projected percentage of completion for each item, as of the first of each month.
2. Show projected dollar cash flow requirements for each month of construction.
3. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of the Owner and Contractor.
4. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs which (i) impacts Project's critical path, (ii) consumes available float or contingency time, and (iii) extends work beyond contract completion date.
5. If the Contractor provides an accepted schedule with an early completion date, the Owner reserves the right to reduce the duration of the work to match the early completion date by issuing a deductive Change Order at no change in Contract Price.

B. Submittal Schedule for Shop Drawings and Samples in accordance with Section 01340. Must show:

1. The dates for Contractor's submittals.
2. The dates submittals will be required for owner furnished products, if applicable.
3. The dates approved submittals will be required from the Engineer.
4. A list of all long lead items (equipment, materials, etc).

1.05 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.

B. Show changes occurring since previous submission of schedule:

1. Major changes in scope.
2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other prime contractors.

1.06 SUBMISSIONS

A. Submit initial schedules to the Engineer within 10 days after the effective date of the Agreement.

1. The Engineer will review schedules and return review copy within 21 days after receipt.
2. If required, resubmit within 7 days after return of review copy.

B. Submit a minimum of five (5) copies of revised monthly progress schedules with that month's application for payment.

1.07 DISTRIBUTION

A. Distribute copies of reviewed schedules to:

1. Owner (Two copies)
2. Engineer (Two copies)
3. Job Site File (One copy)
4. Subcontractors (As needed)
5. Other Concerned Parties (As needed)

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01340

SHOP DRAWINGS, WORKING DRAWINGS AND SAMPLES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The contractor shall submit to the Engineer for review, such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.

B. The Contractor shall submit five (5) copies of shop drawings or other data to the Engineer.

C. Within thirty (30) calendar days after the effective date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specific items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings.

D. The contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and Engineer. This log should include the following items:

1. Submittal-Description and Number assigned.
2. Date to Engineer.
3. Date returned to Contractor (from Engineer).
4. Status of Submittal (Approved/Resubmit/Rejected).
5. Date of Resubmittal and Return (as applicable).
6. Date material released (for fabrication).
7. Projected date of fabrication.
8. Projected date of delivery to site.
9. Status of O & M submittal.

1.02 RELATED SECTIONS

A. Section 01310 - Construction Schedules

B. Section 01720 - Project Record Documents

C. Section 01730 - Operating and Maintenance Data

D. Other Sections as applicable.

1.03 CONTRACTOR'S RESPONSIBILITY

A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy

of the Drawings and data shall bear Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.

B. Determine and verify:

1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance and Specifications

C. The Contractor shall furnish the Engineer a schedule of Shop Drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.

D. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings, Working Drawings and Samples will be needed.

E. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, approved by the Engineer.

F. The Contractor shall submit to the Engineer all shop drawings, working drawings and samples sufficiently in advance of construction requirements and shall account for Engineers Shop Drawing review time accordingly.

G. The Contractor shall submit two (2) copies of descriptive or product data submittals to complement shop drawings for the Engineer plus the number of copies which the Contractor requires. The Engineer will retain two (2) sets. All blueprint shop drawings shall be submitted with one (1) set of reproducible and four (4) sets of print. The Engineer will review the drawings and return to the Contractor the set of marked-up drawings with appropriate review comments.

H. The Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the review and Approval by Engineer of the necessary Shop Drawings.

1.04 ENGINEER'S REVIEW OF SHOP DRAWINGS

A. The Engineer's review of drawings, data and samples submitted by the Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The Engineer's review and exception if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.

B. The review of drawings and schedules will be general, and shall not be construed:

1. as permitting any departure from the Contract requirements;
2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.

C. If the drawings or schedule as submitted describe variations and/or show a departure from the Contract requirements which Engineers finds to be in the interest of the Owner and to be minor as not to involve a change in the Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.

D. When reviewed by the Engineer, each of the Shop Drawings will be identified as having received such review being so stamped and dated. Shop Drawings stamped "REJECTED" and with required corrections shown will be returned to the Contractor for correction and resubmittal.

E. Resubmittals will be handled in the same manner as the first submittals. On resubmittals, the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.

F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.

G. The Engineer will review one submittal and one re-submittal after which cost of review will be borne by the Contractor. The cost of engineering shall be equal to the Engineer's charges to the Owner under the terms of the Engineer's agreement with the Owner.

H. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

I. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor, and will not be considered "Rejected" until resubmitted.

J. The Engineer shall return Shop Drawing submittals to the Contractor within twenty-one (21) days calendar days from the date the Engineer receives them.

1.05 SHOP DRAWINGS

A. When used in the Contract Documents, the term "Shop Drawings" shall be considered to mean Contractor's plans for material and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop Drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive to required Shop Drawings as defined above.

B. Drawings and schedules shall be checked and coordinated with work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Each Shop Drawing, shall have a blank area 3 1/2 inches by 3 1/2 inches, located adjacent to the title block. The title block shall display the following:

1. Number and title of the drawing.

2. Date of drawing or revision.

3. Name of project building or facility.

4. Name of contractor and subcontractor submitting drawing.

5. Clear identification of contents and location of work.

6. Specification title and number.

D. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.

E. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

F. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, address and telephone number of the manufacturer's representative and service company so that service and spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with each shop drawing submittal.

G. All manufacturers or equipment supplier who proposes to furnish equipment or products under Divisions 11, 12, 13, 14, 15 and 16 shall submit an installation list to the Engineer along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least five (5) years.

H. Only the Engineer will utilize the color "red" in marking Shop Drawing submittals.

I. Before final payment is made, the Contractor shall furnish to Engineer two (2) sets of record shop drawings all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, piping, electrical system and instrumentation system.

1.06 WORKING DRAWINGS

A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the Contractor's plans for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and false-work; for underpinning; and for such other work as may be required for construction, but does not become an integral part of the project.

B. Copies of working drawings as noted in subparagraph 1.06A above, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the Engineer) in advance of their being required for work.

C. Working drawings shall be signed by a Registered Professional Engineer, currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the Engineer, which review will be for general conformance and will not relieve

the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. The Contractor assumes all risks of error; the Owner and Engineer shall have no responsibility therefore.

1.07 SAMPLES

A. The Contractor shall furnish, for the approval of the Engineer, samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.

B. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.

2. Full range of color, texture and pattern.

3. A minimum of two samples of each item shall be submitted.

C. Each sample shall have a label indicating

1. Name of Project

2. Name of Contractor and Subcontractor

3. Material or Equipment Represented

4. Place of Origin

5. Name of Producer and Brand (if any)

6. Location in Project

(Samples of finished materials shall have additional marking that will identify them under the finished schedules.)

D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.07B above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

E. Approved samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved will be returned to the Contractor at his expense, if so requested at time of submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Submit to the Engineer a Schedule of Values allocated to the various portions of the Work, within 14 days after the effective date of the Agreement.

B. Upon request of the Engineer, support the values with data which will substantiate their correctness.

C. The Schedule of Values shall be used as the basis for the Contractor's Applications for Payment.

1.02 RELATED SECTIONS

A. Section 01152 - Applications for Payment

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Present schedule on an 8-1/2 inch x 11 inch white paper; Contractor's standard forms and automated printout will be considered for approval by the Engineer upon Contractor's request. Identify schedule with:

1. Title of Project and location
2. Engineer and Project number
3. Name and Address of Contractor
4. Contract designation
5. Date of submission

B. Schedule shall list the installed value of the component parts to include individual equipment, piping, electrical, paving, of the Work (as required) in sufficient detail to serve as a basis for computing values for progress payments during construction and for additions and deletions to the Work.

C. For the various portions of the Work:

1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

D. The sum of all values listed in the schedule shall equal the total Contract Sum.

E. Schedules are subject to Engineer's approval wherein additional line item detail may be required.

1.04 ENGINEERS APPROVAL

A. The schedule of Values is subjected to the Engineer’s approval.

1. Additional line item detail may be required.
2. Supporting information may be required.
3. Additional comparison trade bids may be required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - PRODUCTS (NOT USED)

END OF SECTION

SECTION 01380

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall employ a professional photographer to take digital construction record photographs for preconstruction conditions, periodically during course of Work, and post-construction.

1.02 RELATED SECTIONS

A. Section 01152: Application for Payment

B. Section 01720: Project Record Documents

C. Other Sections as applicable.

1.03 PHOTOGRAPHY REQUIRED

A. View and Quantities Required:

1. Take a minimum of 24 images of the site and adjacent property at the following intervals:

a. Preconstruction

b. Monthly or other interval, at the cut -off date in accordance with Applications for Payment

c. At construction events or discoveries as directed by the Owner or Engineer.

d. At post-construction.

2. Aerial photography shall be acceptable in addition to ground level exposures for items out of sight of aerial photography.

B. Aerial photography shall be required in addition to ground level images for items out of sight of ground level photography.

C. Photograph from locations to adequately illustrate condition of construction and state of progress.

D. At successive periods of photography, take at least one photograph from the same overall view as previously.

E. Consult with the Owner and Engineer at each period of photography for instructions concerning views required.

PART 2 - PRODUCTS

2.01 CAMERA REQUIREMENT

A. A Digital Single Lens Reflex (DSLR) is required.

B. Point and shoot, mobile phones and disposal cameras are not acceptable.

2.02 PHOTOGRAPHS

A. The minimum file size is 6.0 megapixels per image.

B. All images shall be color and in RGB format.

C. Acceptable file formats include:

1. Tagged Information File Format (TIFF)
2. Joint Photographic Experts Group 2000 (JPEG2000)
3. Digital Negative (DGN)

D. Unacceptable file formats include:

1. Bitmap (BMP)
2. Graphics Interchange Format (GIFF)
3. Portable Network Graphic (PNG)
4. Raw format

2.03 METADATA

A. Each image must contain descriptive metadata as follows:

1. Name of Project
2. Orientation of View
3. Date and time of image
4. Name and address of Photographer
5. Photographer's numbered identification of image
6. Meaningful and descriptive filenames unique to each image.

2.04 COPYRIGHT

A. No copyrighted photographs will be accepted.

2.05 EDITING

A. Images shall not be edited in any way.

2.06 TECHNIQUE

A. Factual presentation

B. Magnification commensurate with the level of detail required.

C. Correct image and focus

1. High resolution and sharpness
2. Maximum depth of field
3. Minimum distortion

2.07 DELIVERY OF IMAGES

A. Deliver electronic image file to the Owner and Engineer to accompany each Application for Payment or as directed.

B. Electronic file storage media shall be a durable, commercial quality USB memory device of sufficient capacity to store the intended contents.

C. Electronic file storage media shall be labeled and identified by project title and project number.

D. The photographer shall keep electronic copies for a minimum of two years from Owner acceptance.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section describes the Contractor minimum responsibilities in meeting the quality requirements of the Contractor Documents.

1.02 RELATED SECTIONS

A. Section 01050 – Field Engineering and Surveying

B. Section 01410 – Materials and Installation Testing

C. Section 02200 – Earthwork

1.03 OBSERVATION AT PLACE OF MANUFACTURE

A. Unless otherwise specified, all products, materials, and time and equipment shall be subject to observation by the Owner at the place of manufacture.

B. The presence of the OWNER at the place of manufacture however, shall not relieve the Contractor or of the responsibility for furnishing products, materials, and equipment which comply with all requirements of the Design Criteria Package. Compliance is a duty of the Contractor.

C. The Contractor shall advise the Owner and Engineer promptly upon placing orders for materials and equipment so that arrangements may be made, if desired, for observation before shipment from the place of manufacture.

D. The Engineer may require the contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contractor documents. All costs of this testing and providing statements and certificates shall be subsidiary obligation of the Contractor and no extra charge to the Owner shall be allowed on account of such testing and certification.

1.04 SAMPLING AND TESTING

A. Unless otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered.

B. The Owner and the Engineer reserve the right to use any generally accepted system of sampling and testing which will insure the Owner that the quality of the workmanship is in full accord with the Contract Documents.

C. Any waiver by the Owner of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial Work, shall not be construed as a waiver of any requirements.

D. The Owner and the Engineer reserve the right to make independent investigations and tests at any time.

E. Failure of any portion of the Work to meet any of the requirements of the Design Criteria Package, shall be reasonable cause for the OWNER to require the removal or correction and reconstruction of any such Work at the cost of the Contractor.

1.05 SITE INVESTIGATION AND CONTROL

A. The Contractor shall verify all dimensions in the field and shall check field conditions continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the Work due to its failure to comply with this requirement.

B. The Contractor shall inspect related and appurtenant work, and shall report in writing to the Owner and the Engineer any conditions that will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at its cost.

1.06 OBSERVATION AND TESTING

A. The work or actions of the testing laboratory shall in no way relieve the CONTRACTOR of its obligations under the Contract. The laboratory testing work will include such observations and testing required by the OWNER. The testing laboratory will have no authority to change the requirements of the Design Criteria Package, nor perform, accept or approve any of the CONTRACTOR's Work.

B. The Contractor shall allow the Owner and the Engineer ample time and opportunity for field observation and testing materials and equipment to be used in the Work.

C. The Contractor shall advise the Owner and the Engineer promptly upon placing orders for materials and equipment so that arrangements may be made, if desired, for observation before shipment from the place of manufacture. The Contractor shall at all times furnish the owner and the Engineer facilities including labor, and allow proper time for inspecting and testing materials, equipment, and workmanship.

D. The Contractor must anticipate that possible delays may occur in the execution of its work due to the necessity of materials and equipment being inspected and accepted for use. The Contractor shall furnish, at its own expense, all samples of materials required by the Owner and the Engineer for testing, and shall make its own arrangements for providing water, electric power, or fuel for the various observations and tests of structures and equipment.

1.07 RIGHT OF REJECTION

A. The Owner and the Engineer shall have the right, at all times and places, to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the site.

B. If the Owner or its representative, through an oversight or otherwise, has accepted materials or work which is defective or which is contrary to the Design Criteria Package, such materials, no matter in what stage or condition of manufacture, delivery, or erection, may be subsequently rejected.

C. The Contractor shall promptly remove rejected articles or materials from the site of the Work after notification of rejection. All costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 BUOYANCY

A. The Contractor shall be completely responsible for any tanks, pipelines, manholes, foundations or similar improvements that may become buoyant during the construction operations due to groundwater levels. Should there be any possibility of buoyancy, the Contractor shall take the necessary steps to prevent damage due to floating or flooding, and shall repair or replace said improvements at no additional cost.

3.02 DEVIATION FROM SPECIFICATIONS

A. If any part of a submittal deviates from the plans and specifications, it is up to the Contractor to indicate such deviation—in writing—to the Engineer, for determination as to acceptance of the deviation. If no deviation is submitted, it is assumed that the Contractor has fully and completely followed the plans and specifications, and that any discrepancy discovered during construction shall be corrected completely at the expense of the Contractor.

3.03 AMERICANS WITH DISABILITIES ACT (ADA)

A. The Contractor shall make every effort to ensure all concrete work including, but not limited to accessible sidewalks, routes, ramps and curb ramps is compliant with the ADA and Florida Building Code Accessibility.

B. Prior to and during concrete placement, the contractor shall verify the formwork for compliance. Any and all concrete work which is not compliant shall be removed and replaced at no cost to the Owner.

END OF SECTION

SECTION 01410

MATERIALS AND INSTALLATION TESTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Contractor shall employ and pay for the services of an independent testing laboratory approved by the Engineer, to perform materials and installation testing of the type and frequency specified in the Contract Documents including, but not limited to, Geotechnical Testing Services and concrete testing.

B. Geotechnical Testing Services shall include, but not be limited to, periodic site inspections, soil proctor tests, soil classification tests and soil densities or compaction tests.

C. The engineer may, at any time, elect to have materials and equipment tested for conformity with the Contract Documents.

D. Contractor shall include cost of testing in the Contract Price.

E. Piping pressure test and bacteriological testing shall be in accordance with the applicable Section.

1.02 RELATED SECTIONS

A. Section 01050 – Field Engineering

B. Section 02200 – Earthwork

C. Section 03300 – Cast-In-Place Concrete

1.03 REFERENCES

A. FDOT Design Standards.

B. FDOT Standard Specifications for Road and Bridge Construction.

C. Broward County Traffic Engineering Division (BCTED) Minimum Standards and the BCTED Pavement Markings & Signs Detail Sheet.

1.04 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents

2. Approve or accept any portion of the Work

3. Perform any duties of the Contractor

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES

A. Provide all testing required by the Contract Documents as well as laws, ordinances, rules, regulations, orders, or approvals of public authorities.

B. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

C. Cooperate with laboratory personnel, and provide access to Work and to Manufacturer's operations.

D. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

E. Provide to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.

F. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Engineer may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contractor Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.

G. Furnish incidental labor and facilities:

1. To provide access to Work to be tested
2. To obtain and handle samples at the Project site or at the source of the product to be tested
3. To facilitate inspections and tests
4. For storage and curing of test samples

H. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

I. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.

J. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Contractor's convenience.

K. If the Owner requests tests in addition to those specified in the contract, and if the test results indicate the material or equipment complies with the Contract Documents, the Owner shall pay for the cost of the testing laboratory. If the tests and any subsequent retests indicate the materials and equipment fail to meet the requirements of the Contract Documents, the Contractor may pay for the laboratory costs directly to the testing firm or the total of such costs shall be deducted from any payments due the Contractor.

L. The Contractor shall pay costs for additional trips to the project by the agency when scheduled times for tests and inspections are canceled and agency is not notified sufficiently in advance of cancellation to avoid the trip.

3.02 TESTING

A. The Contractor shall obtain the services of a professional testing laboratory approved by the Engineer to perform the following type of tests and test frequencies. Copies of all reports are to be sent to the Engineer as soon as possible.

B. Density tests for trench backfill at a minimum rate of three (3) tests per lift in 1,000 feet of trench, but not less than two (2) tests per lift if less than 500 feet of trench, at Engineer's discretion based on field observation.

C. Density tests for subgrade compaction at a minimum rate of three (3) tests in 1,000 feet of roadway, but not less than two (2) tests, at Engineer's discretion based on field observation.

D. Density tests for lime rock base at a minimum rate of three (3) tests per day on each course of completed compacted base, but not less than two (2), at Engineer's discretion based on field observation.

E. Density tests for roadway crossings at the rate of one test per lane per lift of compacted material, beginning one foot above the normal water table.

F. If in the opinion of the Engineer, suitable compaction has not been achieved around structures, density tests may be required.

G. Concrete compressive strength at the rate of three (3) cylinders per the lesser of 50 cubic yards or per day.

H. Should the above test results indicate deficiencies, the Engineer may order additional tests at the Contractor's expense, and all reworked areas shall be retested at the Contractor's expense.

I. Testing in the County right-of-way shall meet the requirements of the Florida Department of Transportation.

END OF SECTION

SECTION 01505

CONTROL OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall furnish personnel and equipment which will be efficient, appropriate and a quantity large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Proposal. If at any time such personnel appear to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the personnel and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 01015 – General Requirements

C. Section 01030 – Special Project Procedures

D. Other Sections as applicable.

1.03 PIPE LOCATIONS

A. Pipeline shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons.

1.04 OBSTRUCTIONS

A. The attention of the Contractor is drawn to the fact that during digging at the Project site, the possibility exists of the Contractor encountering various water, sewer, gas, telephone, electrical, or other lines not shown on the Drawings. The Contractor shall exercise extreme care before and during digging to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, The Contractor shall repair the line at no cost to the Owner.

B. The Contractor shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.

C. The Contractor shall verify the exact locations and depths of all utilities shown and the Contractor shall make exploratory excavations of all utilities that may interfere with the work. All such exploratory excavations shall be performed as soon a practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's work. When such exploratory excavations show the utility location as shown to be in error, the Contractor shall so notify the Engineer.

D. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility. Test pits shall be dug at the Contractor's expense, as directed.

E. The Contractor shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

F. In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the Owner to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

G. Where the proper completion of the work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Engineer and the owner of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

H. Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the Contractor at the Contractor's expense. Sewer laterals are included.

I. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement owner before being concealed by backfill or other work.

J. All power, telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and any other cables encountered along the line of the work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

1.05 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. 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. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such a limiting the length of open trench or prohibiting stacking excavated material in the street, and requiring that the trenches shall not remain open overnight.

B. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

1.06 TEST PITS

A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor at his cost at the direction of the Consultant. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Consultants.

1.07 UTILITY CROSSINGS

A. It is intended that wherever existing utilities such as service lines must be crossed, deflection of the pipe within recommended limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when in the opinion of the City or Consultant this procedure is not feasible, he may direct the use of fittings.

1.08 SITE CLEANLINESS

A. Dust Abatement - The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer.

B. Rubbish Control - During the progress of the work, the Contractor shall keep the site of the work and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

C. Sanitation

1. Toilet Facilities - Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites

shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.

2. Sanitary and Other Organic Wastes - The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto.

1.09 RELOCATIONS

A. The Contractor shall be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, conduits and drains that interfere with the positioning of the work as set out on the Drawings. The cost of all such relocations shall be included in the bid for the project and shall not result in any additional cost to the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 COOPERATION WITHIN THIS CONTRACT

A. All firms or persons authorized to perform any work under this Contract shall cooperate with the General Contractor and his subcontractors or trades, and shall assist in incorporating the work of other trades where necessary or required.

B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

3.02 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions injured shall be reconstructed by the Contractor at his own expense.

B. Further, the Contractor shall take all necessary precaution to prevent damage to any structure due to water pressure during and after construction and until such structure is accepted and taken over by the Owner.

3.03 PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the landowner.

3.04 RESTORATION

A. Temporary restoration shall be completed within five days of pipe installation. Temporary restoration shall include all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including the removal of debris, trash, and deleterious materials. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area. All temporarily restored areas shall be maintained by the Contractor. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed. The Contractor is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the Consultant.

B. Wherever sidewalks or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the Contractor shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

C. Final restoration shall be completed within thirty days of pipe acceptance. Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction; final grading, placement of sod, pavement marking, etc., all complete and finished, acceptable to the Consultant.

D. In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with the adjacent undisturbed pavement.

E. The Contractor shall test an installed section of pipeline within five calendar days from completion of the pipeline. A section of pipe is defined as a pipe section which can be isolated by valves for appurtenances is satisfactorily completed, the Contractor shall provide the Consultant with a "Schedule of Existing Facilities Restoration" which will be reviewed and be acceptable to the Consultant. The schedule shall show the existing facilities to be restored and schedule of beginning and completion dates for each item of restoration. The work for completing the final restoration of existing facilities for a tested section of work shall be completed within 30 days of acceptance of the pipeline testing.

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish, install, and maintain temporary utilities required for construction, remove on completion of work.

B. Pay all fees associated with temporary utilities including water consumption charges.

1.02 RELATED SECTIONS

A. Section 01010: Summary of Work

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State and Local codes and regulations and with utility company requirements.

C. Comply with County Health Department and Environmental Regulations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials may be new or used but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

A. Arrange with utility company, provide service required for power and lighting, and pay all costs for service and for power used in the construction, testing and trial operation prior to final acceptance of the work by the Owner.

B. Install circuit and branch wiring, with the area distribution boxes located so that power and lighting is available throughout the construction by the use of construction type power cords.

C. Provide adequate artificial lighting for all areas of work when natural light is not adequate to work, and all areas accessible to the public.

2.03 TEMPORARY WATER

A. Arrange with the CITY to provide water for construction purposes.

B. Install branch piping with taps located so that water is available throughout the construction by the use of hoses.

C. C. Install at each and every connection to the Owner water supply a backflow preventer meeting the requirements of ANSI A40.6 and AWWA C511. Contractor shall be required to meter and pay for all water used.

2.04 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

PART 3 - EXECUTION

3.01 GENERAL

A. Maintain and operate systems to assure continuous service.

B. Modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore permanent facilities used for temporary services to specified condition.

END OF SECTION

SECTION 01530

EXISTING UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for specifications related to construction in the vicinity of existing utilities.

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 01015 – General Requirements

C. Section 01030 – Special Project Procedures

D. Other Sections as applicable.

1.03 CONTRACTOR RESPONSIBILITIES

A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities including, but not limited to, electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.

B. Prior to underground construction, the Contractor is required by the Underground Facility Damage Prevention and Safety Act, Chapter 556 FS to contact Sunshine 811, for the location of underground utilities.

C. Where existing utilities and structures are indicated in the Contract Documents, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

1.04 NOTIFICATION OF UTILITY OWNER

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the CONTRACTOR shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than three days nor more than seven days prior to excavation so that a representative may be present during such excavation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 RESTORATION OF PAVEMENT

A. General: All paved areas including concrete, asphaltic concrete, berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents. All pavements which are subject to partial removal shall be neatly saw-cut in straight lines.

B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw-cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

END OF SECTION

SECTION 01531

PROTECTION OF EXISTING PROPERTY

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this project. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. In the event of any claims for damage or alleged damage to property as a result of work, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

1.02 RELATED SECTIONS

A. Section 01015 – General Requirements

B. Section 01030 – Special Project Procedures

C. Section 01570 – Traffic Regulation

1.03 PRESERVATION AND RESTORATION

A. Contractor shall be responsible for the preservation and protection of property adjacent to the Work site against damage or injury as a result of this project. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

1.04 ADJACENT PROPERTY OWNER NOTIFICATION

A. The Contractor shall prepare a written Notice to Property owners adjacent to the project Work site notifying them of the schedule of work affecting them and anticipated inconveniences they may expect. The notice shall meet the approval of the Engineer and be delivered to property owners at least 72 hours prior to construction adjacent to their property. This notice shall indicate the work to be performed, the time it will take to perform the work, the time when the water service to the property owner will be disrupted.

1.05 BARRICADES, WARNING SIGNS AND LIGHTS

A. In addition to the requirements of Section 01570 – Traffic Regulation, the Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights for the preservation and protection of property adjacent to the work site. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.

1.06 TREES AND LANDSCAPING PROTECTION

A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or landscaping in or near the project site, and shall not trim or remove any trees or landscaping unless such trees or landscaping have been approved for trimming or removal by the jurisdictional agency or owner. All existing trees or landscaping which are damaged during construction shall be replaced by the Contractor or a certified tree/landscaping company to the satisfaction of the owner.

B. Replacement: The Contractor shall immediately notify the jurisdictional agency or owner if any tree or landscaping is damaged by the Contractor's operations. If, in the opinion of the jurisdictional agency or owner, the damage is such that replacement is necessary, the Contractor shall replace the tree or landscaping at its own expense. The tree or landscaping shall be of a like size and variety as the tree or landscaping damaged, or, if of a smaller size, the Contractor shall pay any compensatory payment.

C. All permit fees associated with the removal and replacement of trees and landscaping damaged or destroyed shall be the responsibility of the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01540

SECURITY

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for requirements of security, entry control, personnel identification and miscellaneous restrictions.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work

1.03 SECURITY PROGRAM

A. Protect Work, existing premises and Owner's operations from theft, vandalism and unauthorized entry.

B. Initiate program in coordination with Owner's existing security system at job mobilization.

C. Maintain program throughout construction period until Owner occupancy as directed by Engineer.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification.

C. Maintain log of workmen and visitors, make available to Owner on request.

D. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

1.05 PERSONNEL IDENTIFICATION

A. All personnel shall wear clothing bearing the company information of which they are employed.

B. Provide additional security as required by the Owner.

C. Become familiar with Owner and Engineer representatives and restrict access to job site to these representatives.

PART 2 - PART 2 – PRODUCTS (NOT USED)

PART 3 - PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01550

SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.01 GENERAL

A. This section provides general specifications for the contractors' access to the site and limitations on storage or lay-down area.

1.02 RELATED SECTIONS

A. Section 01015 – General Requirements

B. Section 01030 – Special Project Procedures

C. Section 01505 – Control of Work

1.03 HIGHWAY LIMITATIONS

A. The Contractor shall make his own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the work.

1.04 TEMPORARY ACCESS RESTORATION

A. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including the removal of debris, trash, and deleterious materials..

B. Temporary restoration shall include all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust

C. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area.

D. All temporarily restored areas shall be maintained by the Contractor. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed.

E. Temporary restoration shall be completed within five days of pipe installation or as specified.

F. The Contractor is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the Engineer.

G. Final restoration shall be completed within thirty days of pipe acceptance. Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction; final grading, placement of sod, pavement marking, etc., all complete and finished, acceptable to the Engineer.

H. In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with the adjacent undisturbed pavement.

1.05 CONTRACTOR'S WORK AND STORAGE AREA

A. Contractors on-site work and storage area plan shall be submitted for Owners approval no later than 30 days after NTP.

1. Owner approval of the work are and storage plan is required prior to commencement.

B. The Contractor shall make his own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Work to be performed under this section shall include furnishing all materials and labor necessary to regulate vehicular and pedestrian traffic.

B. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow around the construction area.

C. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

1.02 RELATED SECTIONS

A. Section 01011 – Special Project Procedures

B. Section 01015 – General Requirements

C. Section 01505 – Control of Work

1.03 REFERENCES

A. The Work under this Contract shall be in strict accordance with the following codes and standards.

1. The City of Pembroke Pines
2. Broward County Traffic Engineering Division
3. Florida Department of Transportation Design Standards and Specifications
4. OSHA Safety and Health Standards for Construction.
5. Federal Highway Administration Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD)
6. Federal Highway Administration Traffic Controls for Street and Highway Construction and Maintenance Operations

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE OF TRAFFIC

A. For the maintenance and protection of vehicular and pedestrian traffic in public or private streets and ways, the Contractor shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights and other safety devices in accordance with the requirements of the "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations," published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1).

B. The Contractor shall provide a Maintenance of Traffic Plan, sealed by a Professional Engineer registered in the State of Florida. The plan, and subsequent revisions, must be approved by the Broward County or the Florida Department of Transportation and the applicable local municipality.

C. The Contractor shall take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The Contractor shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of OSHA and Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.

D. The Contractor shall remove traffic control devices when no longer needed, shall repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

3.02 CORRECTIONS

A. Upon notification by the owner either verbally or in writing, the contractor shall correct any noted deficiencies within one hour.

B. Inspection of all traffic control items shall be accomplished at least twice per day. One of these inspections shall be at the end of the work day or at night.

3.03 TRAFFIC AND VEHICULAR ACCESS:

A. Emergency Vehicles: No single family residence, multi-family residence, apartment, commercial building or place of employment shall be without access to emergency vehicles for a period longer than three hours. The Contractor shall notify in writing the Engineer, the police, fire and other emergency departments and agencies when and where work is to be accomplished that will affect their operations at least two days in advance of such work.

B. Commercial Properties: Access to commercial property shall not be blocked for a period of more than 30 minutes during the time such properties are open for business.

C. Residential Property: Access to residential property shall not be blocked for a period of more than 4 hours.

3.04 ROAD CLOSURE

A. No roads shall be blocked to traffic without adequate detour facilities for a period of more than 30 minutes or as directed by the governing authority.

B. At least seven days prior to a proposed road closure, the contractor shall submit to the City Engineer a complete traffic control plan. This plan shall include the following minimum information:

1. Sketch of work site and all area roads, streets and mark driveways.

2. Proposed detour route.

3. All necessary traffic control devices to be used.

4. Emergency contractor contact person name and phone to be available 24 hours a day.

5. Estimated times/dates of road closure.

3.05 CONSTRUCTION IN OTHER THAN STATE HIGHWAY RIGHT-OF-WAY:

A. Construction within right-of-way other than State highway shall be made in full compliance with all requirements of the Florida Department of Transportation and to the satisfaction of the local governing bodies. All necessary barricades, detours, lights

and other protective measures shall be provided for the protection of both pedestrian and vehicular traffic.

B. The Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work or those visiting the site.

3.06 FLAGMEN

A. Provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic.

3.07 FLARES AND LIGHTS

A. Provide lights as required to clearly delineate traffic lanes and to guide traffic as required.

B. Provide lights for use by flagmen in directing traffic.

C. Provide illumination of critical traffic and parking areas as required.

3.08 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

B. Monitor parking of construction personnel's private vehicles.

C. Maintain free vehicular access to and through parking areas and driveways.

D. Prohibit parking on or adjacent to access roads, or in non-designated areas.

END OF SECTION

SECTION 01580

PROJECT IDENTIFICATION SIGNS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install and maintain one project identification sign.

B. Remove sign upon completion of construction.

C. Allow no other signs to be displayed without approval of Owner.

1.02 PROJECT IDENTIFICATION SIGN

A. One painted or printed sign of size, design and lettering as shown on sample provided by Owner.

1. Locate as directed by Owner.

2. Colors as indicated.

1.03 QUALITY ASSURANCE

A. Provide one electronic proof for Owner approval prior to release for printing or painting.

PART 2 - PRODUCTS

2.01 SIGN MATERIALS

A. Structure and framing shall be pressure treated (2) 4”x4”x10’ posts .

B. Foundation shall be two eighty pound bags of concrete per post.

C. Sign Surfaces shall be exterior grade plywood 8 feet wide by 4 feet high with a minimum thickness of 5/8 inch.

D. Rough Hardware: Galvanized

E. Finishes and painting shall be adequate to resist weathering and fading for scheduled construction period.

PART 3 - EXECUTION

3.01 PROJECT IDENTIFICATION SIGN

A. Paint exposed surfaces of supports, framing and surface material; one coat of primer and one coat of exterior paint.

B. Paint graphics in styles, sizes and colors selected.

C. Lettering shall be as noted.

D. City Logo shall be shown as directed by Owner.

E. Background shall be white.

3.02 SIGN LOCATION

A. Sign shall be located within the City right of way in an area approved by the Owner.

3.03 MAINTENANCE

A. Maintain sign and supports in a neat, clean condition; repair damages to structure, framing or sign.

B. Relocate sign as required by progress of the work.

3.04 REMOVAL

A. Remove sign, framing, supports and foundations at completion of project or at direction of Engineer.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Material and equipment incorporated into the Work.

1. Conform to applicable specifications and standards.
2. Comply with size, make, and type and qualify specified, or as specifically approved in writing by the Engineer.
3. Manufactured and Fabricated Products.
    a. Design, fabricate, and assemble in accord with the best engineering and shop practices.
    b. Manufacture like part of duplicate units to standard sizes and gauges, to be interchangeable.
    c. Two or more items of the same kind shall be identical, by the same manufacturer.
    d. Products shall be suitable for service conditions.
    e. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 RELATED SECTIONS

A. Section 01030: Special Project Procedures

B. Section 01340: Shop Drawings, Product Data, and Samples

C. Section 01720: Project Record Documents

1.03 APPROVAL OF MATERIALS

A. Only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the work without prior approval of the Engineer.

B. Within 30 days after the effective date of the Agreement, the Contractor shall submit to the Engineer, data relating to materials and equipment he proposes to furnish for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications. The data shall comply with Paragraph 1.07 of this Section.

C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during progress of the work, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the Contractor's expense. Except as otherwise noted, the Owner will make arrangements for and pay for the tests.

D. The Contractor shall submit data and samples sufficiently early to permit work. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner or the Engineer.

E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.

F. The materials and equipment used on the work shall correspond to the approved samples or other data.

1.04 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instruction, obtain, and distribute copies of such instructions to parties involved in the installation, including copies to the Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.05 TRANSPORTATION AND HANDLING

A. Arrange deliveries of Products in accord with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that Products are properly protected and undamaged.

B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

1.06 STORAGE AND PROTECTION

A. The Contractor shall furnish a covered, weather-protected storage structure, providing a clean, dry, noncorrosive environment for all mechanical equipment, valves, electrical and instrumentation equipment, and special equipment to be incorporated into this project. Storage of equipment shall be performed to allow easy access and be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including weather/humidity protection, connection of heaters, placing of storage lubricants in equipment, blocking, or skid storage, etc. Corroded, damaged, or deteriorated equipment and parts shall be replaced before acceptance of the project.

B. Store Products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather-tight enclosures.
2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
3. Store fabricated products above the ground, on blocking or skids, to prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings. Provide adequate ventilation to avoid condensation.
4. Store loose granular materials in a well drained area on solid surfaces to prevent mixing with foreign matter.

C. All materials and equipment to be incorporated in the work shall 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.

D. Cement, sand, and lime shall be stored under a roof, off the ground, and shall be kept completely dry at all times. All structural and miscellaneous steel and reinforcing steel shall be stored off the ground, or otherwise, to prevent accumulations of dirt or grease, and to minimize rusting. Brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking, and spalling to a minimum.

E. Moving parts shall be rotated a minimum of once weekly to insure proper lubrications, and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half-load, once weekly, for an adequate period of time to insure that the equipment does not deteriorate from lack of use.

F. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified, shall be promptly removed from the site of the work, and the Contractor shall receive no compensation for the damaged material or its removal.

G. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained under specific conditions, and free from damage or deterioration.

H. Contractor shall be responsible for protection after installation by providing substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.

I. The Contractor shall be responsible for all materials, equipment, and supplies sold and delivered to the Owner under this Contract, until final inspection of the work and acceptance thereof by the Owner. In the event any such material, equipment, and supplies are lost, stolen, damaged, or destroyed prior to final inspection and acceptance, the Contractor shall replace same without additional cost to the Owner.

J. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract within seven 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 Contractor's Contract. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

1.07 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Products List

1. Within 30 days after the effective date of the Agreement, submit to the Engineer a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.

B. Contractor's Options

1. For Products specified only by reference standard, select any product meeting that standard.

2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications, subject to the base bid.

3. For products specified by naming one or more Products or Manufacturers and an "or equal", the Contractor must submit a request for substitutions of any Product or Manufacturer not specifically named.

a. The Contractor may not submit substitutions for products specified as “No Substitutions Permitted”.

C. Substitutions

1. For a period of 30 days after the effective date of the Agreement, the Engineer will consider written requests from Contractor for substitution of Products.

2. Submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified

b. Changes required in other elements of the work because of the substitution

c. Effect on the construction schedule

d. Cost data comparing the proposed substitution with the Product specified

e. Any required license fees or royalties

f. Availability of maintenance service, and source of replacement materials

3. The Engineer shall be the judge of the acceptability of the proposed substitution.

4. No substitutions will be considered by the Engineer after 30 days from the Contract Date.

D. Contractor's Representation

1. A request for a substitution constitutes a representation that Contractor:

a. Has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified

b. Will provide the same warranties or bonds for the substitution as for the Product specified

c. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects

d. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. The Engineer will review requests for substitutions with reasonable promptness, and notify Contractor, in writhing, of the decision to accept or reject the requested substitution.

1.08 SPECIAL TOOLS

A. Manufacturers of equipment and machinery shall furnish any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order no later than upon completion of the Contract.

1.09 STORAGE AND HANDLING OF EQUIPMENT ON SITE

A. Because of the long period allowed for construction, special attention shall be given to the storage and handling of equipment on site. As a minimum, the procedure outlined below shall be followed.

1. Equipment shall not be shipped until approved by the Engineer. The intent of this requirement is to reduce on-site storage time prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Engineer, unless upon arrival it is to be stored as specified in Paragraph 1.06. Operation and maintenance data, as described in Paragraph 1.08 of Section 01730 shall be submitted to the Engineer for review prior to shipment of equipment.

2. All equipment having moving parts, such as gears, electric motors, etc. and/or instruments, shall be stored in a temperature and humidity controlled building approved by the Engineer, until such time as the equipment is to be installed.

3. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.

4. Manufacturer's storage instructions shall be carefully studied by the Contractor and reviewed with the Engineer by him. These instructions shall be carefully followed and a written record of this kept by the Contractor.

5. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication, and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half-load, once weekly for an adequate period of time to insure that the equipment does not deteriorate from lack of use.

6. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. Mechanical equipment to be used in the work, if stored for longer than ninety (90) days, shall have the bearings cleaned, flushed, and lubricated prior to testing and start up, at no extra cost to the Owner.

7. Prior to acceptance of the equipment, the Contractor shall 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 shall 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 guarantee the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

1.10 WARRANTY

A. For all major pieces of equipment, submit a warranty from the equipment manufacturer as specified in Section 01740.

1.11 SPARE PARTS

A. Spare parts for certain equipment provided under Division 11 through 16 have been specified in the pertinent sections of the Specifications. The Contractor shall collect and store all spare parts so required in an area to be designated by the Engineer. In addition, the Contractor shall furnish to the Engineer an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivered cost.

1.12 LUBRICANTS

A. During testing and prior to acceptance, the Contractor shall furnish all lubricants necessary for the proper lubrication of all equipment furnished under this Contract.

1.13 GREASE, OIL AND FUEL

A. All grease, oil, and fuel required for testing of equipment shall be furnished with the respective equipment. The Owner shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended b the manufacturer with each item of the equipment supplied under Division 11 through 16.

B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment after initial break-in of the equipment, which in no event shall be any longer than three weeks of operation.

1.14 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.15 FASTENERS

A. All necessary bolts, anchor bolts, nuts, washers, plates and bolt sleeves shall be furnished by the Contractor. Bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.

B. All bolts, anchor bolts, nuts, washers, plates, and bolt sleeves shall be Type 316 stainless steel unless otherwise specifically indicated or specified.

C. Unless otherwise specified, stud, tap, and machine bolts shall be of the best quality refined bar iron. Hexagonal nuts of the same quality of metal as the bolts shall be used.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EQUIPMENT, TESTING, AND INSPECTION

A. Regardless of the number of days specified in the individual sections for the manufacturer's representative to be present on the site for inspection and testing, if the equipment fails to perform as specified, then the representative shall remain on site until the malfunction is corrected.

B. The cost for the additional days shall not be added to the cost for the Owner, but shall be to the account of the contractor.

END OF SECTION

SECTION 01630

SUBSTITUTIONS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish and install products specified and named in their respective Specifications or on the Drawings unless substitution is allowed by the requirements stated in this Section.

a. The Contractor may not submit substitutions for products specified as “No Substitutions Permitted”.

B. For products specified only by reference standard, select product meeting that standard, by any manufacturer.

C. For products specified by naming several products or manufacturers, select any one of those products and manufacturers names which complies with their respective Specifications.

D. For products specified by naming only one or more products or manufacturers and stating "or equal", submit a request as for substitutions, for any product or manufacturer which is not specifically named.

E. Requests for any substitutions not submitted in accordance with the instructions herein will be denied.

1.02 RELATED SECTIONS

A. Section 01340 – Shop Drawings, Working Drawings and Samples

1.03 PRODUCTS LIST

A. Within 30 days after award of Contract, submit to Engineer five copies of complete list of major Products which are proposed for installation.

B. Tabulate Products by specification section number and title.

C. For products specified only by reference standards, list for each such Product:

1. Name and address of manufacturer.
2. Trade Name.
3. Model or catalog designation.
4. Manufacturer's data:
5. Reference standards.
6. Performance test data.

1.04 SUBSTITUTION SUBMITTAL REQUIREMENTS – “OR APPROVED EQUAL”

A. Within a period of 30 days after award of Contract, Engineer will consider formal requests from the Contractor for substitution of products in place of those specified.

B. After the end of that period, the request will be considered only in case of product unavailability or other conditions beyond the control of the Contractor.

C. Submit a separate request for each substitution. Support each request with:

1. Complete data substantiating compliance of the proposed substitution with requirements stated in the Contract Documents:

a. Product identification, including manufacturer's name and address.

b. Manufacturer's literature; identify:

1) Product description.
2) Reference standards.
3) Performance and test data.

c. Samples, as applicable.

d. Name and address of similar projects on which product has been used, and the date of each installation

2. Itemized comparison of the proposed substitution with product specified; List significant variations.

3. Data relating to changes in the construction schedule.

4. Any effect of the substitution on separate contracts.

5. List of changes required in other work or products.

6. Accurate cost data comparing proposed substitution with product specified.

7. Designation of required license fees or royalties.

8. Designation of availability of maintenance services, and sources of replacement materials.

D. Substitute products shall not be ordered or installed without written acceptance of Engineer.

E. Engineer will determine the acceptability of proposed substitutions.

1.05 SUBSTITUTIONS WILL NOT BE CONSIDERED FOR ACCEPTANCE WHEN:

A. They are indicated or implied on Shop Drawings or product data submittals without a formal request from Contractor.

B. The manufacture of the product substitution does not meet the Qualifications as stated in the specifications.

C. They are requested directly by a subcontractor or supplier.

D. No data is provided relating to changes in construction schedule.

E. There is any effect of substitution on separate contracts.

F. Changes are required in other work or products.

G. There is no accurate cost data comparing proposed substitution with product specified.

H. There are required license fees or royalties above and beyond the specified vendor.

I. Availability of maintenance services, sources of replacement materials does not equal that provided by the specified vendor.

J. Acceptance will require substantial revision of Contract Documents.

1.06 CONTRACTOR'S REPRESENTATION

A. In making formal request for substitution Contractor represents that:

1. He has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.

2. He will provide the same warranties or bonds for substitution as for product specified.

3. He will coordinate installation of accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.

4. He waives claims for additional costs caused by substitution which may subsequently become apparent.

5. Cost data is complete and includes related costs under his Contract, but not:

   a. Costs under separate contracts.

   b. Engineer's costs of redesign or revision of Contract Documents.

1.07 ENGINEER DUTIES

A. Review Contractor's requests for substitutions in accordance the Shop Drawing review requirements.

B. Notify Contractor, in writing, of decision to accept or reject requested substitution.

1.08 SUBSTITUTION SUBMITTAL REQUIREMENTS – "NO SUBSTITUTIONS PERMITTED"

A. Contractor may not request a substitute item or vendor/manufacturer for which the specifications indicate "No Substitutions Permitted ".

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Administrative and procedural requirements for project closeout.

1. Inspection procedures.

2. Project Record Document submittal.

3. Final cleaning.

B. Warranty and bond submittal.

C. Closeout submittals, warranties and bonds required for specific products of work.

1.02 RELATED SECTIONS

A. Section 01310 - Construction Schedules

B. Section 01370 - Schedule of Values

C. Section 01380 - Construction Photographs

D. Section 01710 - Cleaning

E. Section 01720 - Project Record Documents

F. Section 01740 – Warranties and Bonds

1.03 SUBSTANTIAL COMPLETION

A. Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

2. Advise Owner of pending insurance change-over requirements.

3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

5. Submit record drawings, maintenance manuals, and similar final record information.

6. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

B. When the Contractor considers the Work to be substantially complete, he shall submit a written notice to the Engineer that the Work, or designated portion of the Work, is complete and ready for inspection.

C. Within a reasonable time of receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfulfilled requirements. When the Engineer and Owner concur that the Work, or designated portion of the Work, is substantially complete, the Engineer will prepare the Certificate of Substantial Completion following inspection.

D. Should the Engineer determine that the Work is not substantially complete, he will advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Engineer will repeat inspection when requested and assured that the Work has been substantially completed.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL COMPLETION

A. When Contractor considers the Work to be complete, he shall submit written certification to the Engineer that the Work is completed and ready for final inspection. Include the following:

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, the list has been endorsed and dated by the Engineer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.

5. Submit consent of surety to final payment.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. The Engineer will inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the - Engineer.

1. Upon completion of inspection, the Engineer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete, or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, re-inspection process will be repeated.

1.05 RECORD DOCUMENT SUBMITTALS (REFER TO SECTION 01720 – RECORD DRAWINGS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Execute cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 1505 – Control of Work

C. Section 01550 – Site Access and Storage

1.03 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with applicable codes, ordinances, regulations, and anti-pollution laws.

B. Do not dispose of any unsuitable fill, hazardous or organic material onsite. All such material shall be disposed of in a legal manner by the Contractor, the cost of which shall be included in the Bid.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

A. The Contractor shall keep the area of the Work and other areas utilized or impacted by construction in a neat and clean condition, free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Work site and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations.

B. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

C. Provide on-site containers for the collection of waste materials, debris, and rubbish as required.

3.02 DUST ABATEMENT

A. The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. Means for the control of dust shall include, but not be limited to, sweeping and water trucks. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer.

3.03 FINAL CLEANING

A. Remove temporary protection and facilities installed for protection of the Work during construction.

B. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

C. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section includes the requirements for maintaining, recording, and submitting Project Record Documents including, but not limited to,

1. Record Drawings or As-Built Drawings
2. Record Specifications and other Contract Documents
3. Record Samples, Shop Drawings or Record Product Data

1.02 RELATED SECTIONS

A. Section 01050 - Field Engineering
B. Section 01152 – Applications for Payment
C. Section 01340 - Shop Drawings, Working Drawings and Samples
D. Section 01700 – Project Closeout

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Maintain at the site for the Owner and Engineers review one record copy of:

1. Drawings
2. Specifications
3. Addenda
4. Change Orders and other Modifications to the Contract
5. Engineer's Field Orders or Written Instructions
6. Approved Shop Drawings, Working Drawings, and Samples
7. Field Test Reports
8. Construction Photographs

B. Store Record Documents in the Contractor's field office apart from documents used for construction.

C. File Record Documents in accordance with the CSI format number system utilized in the Contract Documents.

D. Maintain Record Documents in a clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes.

E. Make Record Documents available at all times for inspection by the Engineer.

F. As a prerequisite for monthly progress payments, the Contractor is to exhibit the currently updated Record Documents for review by the Engineer and the Owner.

1.04 RECORDING

A. Record Drawings:

1. Maintain a clean, undamaged set of prints of Contract Drawings to serve as the project Record Drawings.
2. Label each sheet "RECORD DRAWING" in neat large printed letters with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
3. The Record Drawings shall be presented at the same scale as the Contract Drawings.
4. The Record Drawings shall correctly and accurately show all changes from the Contract Drawings made during construction.
5. All information shall be verified and certified by an independent Professional Surveyor and Mapper registered in the State of Florida.
6. All vertical information shall be provided in the datum indicated in the Contract Drawings.
7. Horizontal and vertical locations referenced to base-line or permanent surface improvements.
8. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross reference at the corresponding location on the Record Drawings.
9. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
10. Mark new information that was not shown on Contract Drawings or Shop Drawings.
11. Note related Change Order numbers where applicable.
12. Organize Record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
13. Do not use Record Drawings for construction purposes.
14. Record information concurrently with construction progress.

B. The Record Drawings shall be neat and legible including the following:

1. Above ground piping and equipment:
    a. All equipment locations, dimensions and elevations as indicated in the Contract Drawings.
    b. All building and tank locations, dimensions and elevations as indicated in the Contract Drawings.
    c. All above ground piping size, material, class, lengths, dimensions, and elevations as indicated in the Contract Drawings.
    d. Horizontal locations of piping, fittings, valves and appurtenances.
    e. Elevations of the top of pipe, fittings, valves and appurtenances.as indicated in the Contract Drawings and at 50’ maximum increments
    f. All changes from the original design.
2. Underground pressure pipe including potable water mains sanitary sewer force mains, drainage force mains and the like:

a. All piping size, material, class, lengths, dimensions, bury depth and elevations as indicated in the Contract Drawings.

b. Horizontal locations of piping, fittings, valves and appurtenances.

c. Elevations of the top of pipe, fittings, valves and appurtenances.

d. Elevations as indicated in the Contract Drawings and at 50' maximum increments

e. Lengths of restrained pipe.

f. Water service locations.

g. Meter sizes.

h. All changes from the original design.

3. Gravity sanitary sewer:

a. All piping size, material, class, lengths, slopes, dimensions, and elevations as indicated in the Contract Drawings.

b. Horizontal locations of manholes.

c. Rim, invert, and size of all manholes.

d. Service terminal end locations.

e. Wet well construction including diameter, bottom, invert and float elevations.

f. All changes to piping from the original design.

4. Stormwater Drainage:

a. All piping size, material, class, lengths, dimensions and elevations as indicated in the Contract Drawings.

b. Horizontal locations of manholes and catch basins.

c. Rim, invert, bottom elevations and size of all manholes and catch basins.

d. All surface elevations indicated on the Contract Drawings including, but not limited to, swales, berms, yards, sidewalks, and the like.

e. Horizontal location and elevation of all storm water retention or detention areas.

f. All changes from the original design.

5. Limerock base:

a. Upon completion of all underground utilities and limerock base, and before placement of asphalt, provide the following for Engineer review:

1) Finished limerock base elevations taken at the location of finished asphalt elevations as indicated in the Contract Drawings.
2) Additional elevations as required by the Engineer, including, but not limited to:
(a) Finished limerock base at centerline, edge of median and edge of pavement.
(b) Back of sidewalk or right of way.
(c) Bottom of swale or flow line of gutter.

(d) Top of curb.
(e) High points, low points and grade breaks.
(f) Intersections.

6. Electrical, instrumentation and controls

   a. Horizontal location of all electrical equipment and control cabinetry.

   b. Elevations of the bottom of all electrical and control panels.

   c. Horizontal location and elevation of all conduits including conduit size, route and wire size.

   d. Horizontal location of all light poles and junction boxes.

7. Miscellaneous:

   a. Horizontal location and elevation of all concrete slabs.

   b. Horizontal location, size and material of all fencing.

   c. Location size and material of all existing utilities whether indicated on the Contract Drawings or not.

   d. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

   e. Depths of various elements of foundation in relation to finish first floor datum.

   f. Field changes of dimensions and details.

   g. Details not on original contract drawings.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and Product Data.

4. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

5. Changes made by field order or by Change Order.

D. Record Product Data (Shop Drawings): Maintain one copy of each Product Data submittal.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation.

3. Note related Change Orders and mark-up of record drawings and Specifications.

E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Engineer and the Owner to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work.

1.05 SUBMITTAL

A. Project Record Documents, demonstrating construction progress, shall be submitted with each Application for Payment.

B. Interim Project Record Drawings shall be submitted at significant project milestones including:

1. Construction of wet well or other structures.

2. Construction of catch basins, manholes, pipes and appurtenances.

3. As required by the Engineer.

C. Project Record Documents, demonstrating construction completion shall be submitted with the balance of Closeout documents at the conclusion of construction including:

1. Three sets of signed and sealed sets of prints.

2. One compact disc copy of record drawings in AutoCAD format.

D. Accompany submittals with transmittal letter in duplicate, containing:

1. Date

2. Project Title and Number

3. Contractor's Name and Address

4. Title and Number of each Record Document

5. Signature of Contractor or his Authorized Representative

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 DESCRIPTION

A. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under Contract.

1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.

B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

1.02 RELATED SECTIONS

A. Section 01030 – Special Project Procedures

B. Section 01340 – Shop Drawings, Working Drawings and Samples

C. Section 01700 – Contract Closeout

D. Section 01720 – Project Record Documents

E. Section 01740 – Warranties & Bonds

1.03 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel:

1. Trained and experienced in maintenance and operation of described products.

2. Familiar with requirements of this Section.

3. Skilled as technical writers to the extent required to communicate essential data.

4. Skilled as draftsman competent to prepare required drawings.

1.04 FORM OF SUBMITTALS

A. Prepare data in form of an instructional manual for use by Owner's personnel.

B. Format

1. Size: 8 1/2 inches x 11 inches

2. Paper: 20 pound minimum, white, for typed pages.

3. Text: Manufacturer's printed data, or neatly typewritten.

4. Drawings:

a. Provide reinforced punched binder tab, bind in with text.

b. Reduce larger drawings and fold to size of text pages, but not larger than 11 inches x 17 inches.

5. Provide fly-leaf for each separate product, or each piece of operating equipment.

a. Provide types description of product, and major component parts of equipment.

b. Provide indexed tabs.

6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:

a. Title of Project

b. Identity of separate structure as applicable.

c. Identity of general subject matter covered in this manual.

C. Binders

1. Commercial quality three-ring binders with durable and cleanable plastic covers.

2. Maximum ring diameter shall be 2 inches.

3. When multiple binders are used, correlate the data into related consistent groupings.

1.05 CONTENT OF MANUAL

A. Neatly typewritten Table of Contents for each volume, arranged in systematic order.

1. Contractor, name of responsible principal, address, and telephone number.

2. A list of each product required to be included, indexed to content of the volume.

3. List, with each product, name, address, and telephone number of:

a. Subcontractor of installer

b. Maintenance contractor, as appropriate

c. Identify area of responsibility of each

d. Local source of supply for parts and replacement.

4. Identify each product name and other identifying symbols as set forth in Contract Documents.

B. Product Data

1. Include only those sheets which are pertinent to the specific product.

2. Annotate each sheet to:

a. Clearly identify specific product or part installed.

b. Clearly identify data applicable to installation.

c. Delete references to inapplicable information.

C. Drawings

1. Supplement product date with drawings as necessary to clearly illustrate:

a. Relations of component parts of equipment and systems.

b. Control and flow diagrams.

2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.

3. Do not use Project Record Documents as maintenance drawing.

D. Written text, as required to supplement product date for the particular installation:

1. Organize in consistent format under separate headings for different procedures.

2. Provide logical sequence of instructions of each procedure.

E. Copy of each warranty, bond and service contract issued:

1. Provide information sheet for Owner's personnel, give:

a. Proper procedures in event of failure.

b. Instances which might affect validity of warranties or bonds

1.06 MANUAL FOR MATERIALS AND FINISHES

A. Submit five copies of complete manual in final form.

B. Content for architectural products, applied materials and finishes

1. Manufacturer's data, giving full information on products.

a. Catalog number, size, composition.

b. Color and texture designations.

c. Information required for re-ordering special-manufactured products.

2. Instructions for care and maintenance.

a. Manufacturer's recommendation for types of cleaning agents and methods.

b. Cautions against cleaning agents and methods which are detrimental to product.

c. Recommended schedule for cleaning and maintenance.

C. Content, for moisture-protection and weather-exposed products

1. Manufacturer's data, giving full information on products

a. Applicable standards.

b. Chemical composition.

c. Details of installation.

2. Instructions for inspection, maintenance, and repair.

D. Additional requirements for maintenance data: Respective sections of Specifications.

E. Provide complete information for products specified.

1.07 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit five copies of complete manual in final form.

B. Content, for each unit of equipment and system, as appropriate:

1. Description of unit and component parts.
    a. Function, normal operating characteristics and limiting conditions
    b. Performance curves, engineering data and tests
    c. Complete nomenclature and commercial number of replaceable parts
2. Operating procedures
    a. Start-up, break-in, routine and normal operating instructions
    b. Regulation, control, stopping, shut-down and emergency instructions
    c. Summer and winter operating instructions
    d. Special operating instructions
3. Maintenance Procedures
    a. Routine operations
    b. Guide to "trouble-shooting"
    c. Disassembly, repair and reassembly
    d. Alignment, adjusting and checking
4. Servicing and lubrication schedule
    a. List of lubricants required
5. Manufacturer's printed operating and maintenance instructions
6. Description of sequence of operation by control manufacturer
7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance
    a. Predicted list of parts subject to wear
    b. Items recommended to be stocked as spare parts
8. As-installed control diagrams by controls manufacturer
9. Each contractor's coordination drawings
    a. As-installed color coded piping diagrams
10. Charts of valve tag numbers, with location and function of each valve
11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage
12. Other data as required under pertinent sections of specifications

C. Contents, for each electric and electronic system, as appropriate

1. Description of system and component parts
    a. Function, normal operating characteristics, and limiting conditions
    b. Performance curves, engineering data and tests
    c. Complete nomenclature and commercial number of replaceable parts
2. Circuit directories of panel-boards

a. Electrical service

b. Controls

3. As-installed color coded wiring diagrams

4. Operating procedures:

a. Routine and normal operating instructions

b. Sequences required

c. Special operating instructions

5. Maintenance procedures

a. Routine operations

b. Guide to "trouble-shooting"

c. Disassembly, repair and reassembly

d. Adjustment and checking

6. Manufacturer's printed operating and maintenance instructions

7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

8. Other data as required under pertinent sections of specifications

D. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.

E. Additional requirements for operating and maintenance data: Respective sections of Specifications.

F. Provide complete information for product specified.

1.08 SUBMITTAL SCHEDULE

A. Submit two copies of preliminary draft of proposed formats and outlines of contents of Operation and Maintenance Manuals within 30 days after Notice to Proceed.

1. The Engineer will review the preliminary draft and return one copy with comments.

B. Submit two copies of completed data in final form no later than 30 days following the Engineer's review of the last shop drawing and submittal specified under Section 01340.

1. One copy will be returned with comments to be incorporated into final copies.

C. Submit specified number of copies of approved data in final form directly to the offices of the Engineer, Calvin, Giordano & Associates, within 30 calendar days of product shipment to the project site and preferably within 30 days after the reviewed copy is received.

D. Submit six copies of addendum to the operation and maintenance manuals as applicable and certificates as specified in paragraph 1.01B of Section 01030 within 30 days after final inspection and plant start-up test.

E. Final Operation and Maintenance submittals shall be in large three-ring binders organized by specification Section and plainly marked per paragraph 1.04Ca.

1.09 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment, and maintenance of products, equipment and systems.

B. Operating and maintenance manual shall constitute the basis of instruction.

1. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

1.10 ENGINEER'S O & M CHECKLIST

A. The Engineer will review Operation and Maintenance Manuals submittals on operating equipment for conformance with the requirements of this Section. The review will generally be based upon the O&M Review Checklist (presented on the pages at the end of this section for the benefit of the Contractor and his suppliers).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

O & M REVIEW CHECKLIST

EQUIPMENT SUBMITTED	_____	DATE OF SUBMITTAL	_____
MANUFACTURER	_____	DEGREE OF APPROVAL	_____
SPECIFICATION SECTION	_____	DRAWING NUMBER	_____

_____ Is the submittal correct for model/series/configuration originally submitted with shop drawings?

_____ Is the binding correct with assigned color/printing etc.?

_____ Is the submittal properly indexed?

_____ Does the submittal pertain only to equipment being furnished?

_____ Is the submittal easily understood and instructively arranged?

_____ Does the submittal include start-up, shutdown and troubleshooting procedures?

_____ Are sufficient drawings and schematics included to supplement written descriptions?

_____ Is the listing of name plate data for each piece of supplied equipment provided and attached?

_____ Are all submitted "C" and "D" size drawings printed on paper that is 11 inches high and folded to 8 1/2 inches wide?

_____ Is proper and complete instruction for servicing included?

_____ Is there a suggested operating log sheet for equipment?

_____ Is schedule for lubrication provided?

_____ Is there a recommended preventative maintenance schedule?

_____ Are necessary safety precautions clearly indicated where they relate to the equipment?

_____ Is the Area Representative information provided, i.e., Name, Address, Telephone Number?

_____ Are specified spare parts indicated and listed?

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Compile warranties and bonds as specified in the Contract Documents.

B. Co-execute submittals when so specified.

C. Review submittals to verify compliance with Contract Documents.

D. Submit to the Engineer for review and transmittal to Owner.

1.02 RELATED SECTIONS

A. Section 01030 - Special Project Procedures

B. Section 01700 - Contract Closeout

1.03 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bond, service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: two (2) each.

C. Table of Contents: neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item

2. Firm, with name of principal, address and telephone number

3. Scope

4. Date of beginning of Warranty, bond or service and maintenance contract

5. Duration of warranty, bond or service maintenance contract

6. Provide information for Owner's personnel:

a. Proper procedure in case of failure

b. Instances which might affect the validity of warranty or bond

7. Contractor, name of responsible principal, address and telephone number

1.04 FORM OF SUBMITTALS

A. Prepare in duplicate packets

B. Format:

1. Size 8 1/2 inches x 11 inches, punch sheets for standard 3-post binder

2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:

a. Title of Project

b. Name of Contractor

C. Binders: Commercial quality, three-post (3) binder, with durable and cleanable plastic covers and maximum post width of 2 inches.

1.05 WARRANTY SUBMITTAL REQUIREMENTS

A. For all equipment, submit a one-year warranty from the equipment manufacturer, unless otherwise specified. The manufacturer's warranty period shall be concurrent with the Contractor's for one year commencing at the time of acceptance by the Owner.

B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment and which has a 1 HP motor or which lists for more than $1,000. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.

C. In the event that the equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two-year (2) warranty from the manufacturer shall not relieve the Contractor of the one-year warranty starting at the time of Owner acceptance of the equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 09900

PROTECTIVE COATINGS

PART 4 - GENERAL

4.01 WORK INCLUDED

A. All work required to provide labor, materials, equipment and incidentals to perform all of the necessary surface preparation and painting required to complete this contract in its entirety.

B. The Contractor shall furnish all supervision, labor, tools, materials, equipment, scaffolding or other structures, and supervision required for the transportation, unloading, storage, and application of the paint and associated products covered by this specification.

C. The work includes painting and finishing of all new interior and exterior exposed items above and below grade and surfaces, such as structural steel, miscellaneous metals, ceilings, walls, floors, doors, frames, transoms, roof fans, construction signs, guardrails, posts, fittings, valves, tanks, equipment and all other work obviously required to be painted unless otherwise specified herein or on the Drawings. The omission of minor items in the Schedule of Work shall not relieve the Contractor of his obligation to include such items where they come within the general intent of the Specification as stated herein.

D. All work shall be done in strict accordance with this Specification, the Design Drawings and the painting package, including manufacturer's instructions for surface preparation and painting.

E. The Contractor will obtain, at its own expense, all permits, licenses and inspections and shall comply with all laws, codes, ordinances, rules and regulations promulgated by authorities having jurisdiction which may bear on the Work. This compliance will include Federal Public Law 91-596 more commonly known as the "Occupational Safety and Health Act of 1970".

F. It is the Contractor’s responsibility to examine areas and conditions under which coating systems are to be applied, and to notify the Owner of areas or conditions which are not acceptable. Do not begin surface preparation or application until areas or conditions have been corrected.

G. The following surfaces or items are "NOT" required to be coated:

1. Any code-requiring labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.

2. Any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts, unless otherwise indicated.

3. Aluminum handrails (except where in contact with concrete) walkways, windows, louvers and grating unless otherwise specified herein.

4. Signs and nameplates.

5. Finish hardware.

6. Chain link fence.

7. Piping buried in the ground or embedded in concrete.

8. Concealed surfaces of pipe or crawl space.
9. Nonferrous metals, unless specifically noted otherwise.
10. Electrical switchgear and motor control centers.
11. Stainless steel angles, tubes, pipe, etc.
12. Products with polished chrome, aluminum, nickel or stainless steel finish.
13. Plastic switch plates and receptacle plates.
14. Flexible couplings, lubricated bearing surfaces, insulation and metal and plastic pipe interior.
15. Sprinkler heads.
16. Lifting chain on cranes and hoists
17. Electrical cable, festooned conductor system, cables, collector pole brackets, etc.

4.02 DEFINITIONS

A. The abbreviations and definitions listed below, when used in this Appendix, shall have the following meanings:

ANSI	American National Standards Institute
ASTM	American Society of Testing Materials
AWWA	American Water Works Association
DFT	Dry Film Thickness
FPP	Fiberglass Reinforced Plastic
HCI	Hydrochloric Acid
MDFT	Minimum Dry Film Thickness
MDFTPC	Minimum Dry Film Thickness Per Coat
mil	Thousandths of an Inch
MIL-P	Military Specification - paint
NACE	National Association of Corrosion Engineers
NSF	National Sanitary Foundation
OSHA	Occupational Safety and Health Act
SFPG	Square Feet Per Gallon
SFPGPC	Square Feet Per Gallon Per Coat
SP	Surface Preparation
SSPC	Steel Structures Painting Council

B. Wherever the word “Engineer” occurs in this specification, it shall apply to the authorized representative of the City of Pembroke Pines. Where the word “Contractor” occurs in this specification, it shall apply to the contractor performing any part of or all of this work.

C. Field Painting is the painting of new or rebuilt items at the job site. Field painting shall be the responsibility of the Contractor.

D. Shop Painting is the painting of new or rebuilt items in the shop prior to delivery to the jobsite.

4.03 PROJECT SITE CONDITIONS

The location of this project is Broward County, Florida requires observance and conformance with EPA Volatile Organic Compound (VOC) restrictions. EPA limits the content of VOC’s in painting materials to 2.5 lb/gallon. Information regarding the VOC content of proposed paints will be required during submittals.

4.04 RESOLUTION OF CONFLICTS

A. It shall be the responsibility of the Contractor to arrange a meeting prior to the start of any coatings applications between the Contractor, the Coating Manufacturer whose products are to be used, and the Owner. All aspects of surface preparation, application and coating systems as covered by this Specification will be reviewed at this meeting.

B. Clarification shall be requested promptly from the Owner when instructions are lacking, conflicts occur in the Specifications, or the procedure seems improper or inappropriate for any reason.

C. Copies of all manufacturer's instructions and recommendations shall be furnished to the Owner by the Contractor.

D. It shall be the responsibility of the Coating Manufacturer to have their representative meet in person with the Contractor and Owner before and during the job as a consultant on proper preparation and application of the coating materials unless a meeting is determined to be unnecessary by the Owner.

4.05 SUBMITTALS

A. All submittals must comply with City-specified submittal procedures.

B. Product Data Sheets.

C. Contractor shall submit coating material manufacturer’s printed technical data sheets for products intended for use in each coating system.

1. Data sheets shall fully describe material as to its intended use, generic description, recommended surface preparation and application conditions, primers, material mixing and application (including recommended dry mil thickness recoat time), precautions, safety and maintenance cleaning directions.

2. Safety Data Sheets. Safety Data Sheets (SDS) shall accompany all submittals and shall be easily available for access at the job site during all activities.

D. Coating Schedule: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

4.06 QUALITY ASSURANCE

A. Manufacturer’s Qualifications:

1. Specialize in manufacture of high-performance coatings with a minimum of 25 years successful experience.

2. Able to demonstrate successful performance on comparable projects.

3. Single-Source Responsibility: All coatings shall be products of a single manufacturer for their respective system.

B. Manufacturer’s Representative:

1. The Contractor shall require the manufacturer to furnish a manufacturer’s qualified technical representative to visit the project site for technical support as required and ordered and as may be necessary to resolve field questions or problems attributable to or associated with the manufacturer's products furnished under this Contract or the application thereof.

C. Contractor’s Qualifications:

1. Contractor must have a minimum of an AMPP Level 1 Basic Coatings

Inspector on staff for no less than 6 months, and must submit proof of this credential with their bid.

2. Experience in application of specified coatings for a minimum of 10 years on projects of similar size and complexity to this work.
3. Contractor must comply with all relevant OSHA safety regulations.
4. Use best practices to carry out corrosion prevention activities in the field.
5. Use best practices in environmental protection to prevent environmental degradation, and to ensure careful handling of all hazardous materials.
6. The Contractor must submit, with their bid, a letter of recommendation from the product manufacturer. This letter shall confirm the Contractor's ability to apply the specified coatings.
7. The Contractor must submit, with their bid, a list of a minimum 5 completed projects of similar size and complexity to this work. Include for each project:
    a. Project name & location
    b. Name and contact of owner
    c. Name and contact of specifier
    d. Approximate area of coatings applied
    e. Total project amount value
    f. Date of completion

D. Pre-Application Meeting:

1. A pre-application meeting shall be held at least two (2) weeks before the start of application of coating systems. All parties who directly affect the project shall attend, including the Contractor, Manufacturer, and Owner.
2. The pre-application meeting shall include a review of any circumstances which may impact the project including, but not limited to, the following:
    a. Environmental requirements
    b. Protection of Surfaces not scheduled to be coated
    c. Surface Preparation
    d. Ventilation
    e. Application
    f. Cleaning
    g. Disinfection
    h. Repair
    i. Field Quality Control
    j. Protection of coating systems
    k. 11-month walkthrough
    l. Coordination with other projects

E. 11-Month Walkthrough:

1. The Owner shall organize a project meeting for 11 months after the final

completion date which the Contractor, Manufacturer, and Owner shall attend. Participants will perform a walkthrough of the project and resolve any workmanship or materials discrepancies.

F. DELIVERY, STORAGE, AND HANDLING

1. All coatings shall be delivered to the mixing room in unbroken containers, bearing the manufacturer's brand, date of manufacture, and name. They shall be used without alteration and mixed, thinned, and applied in strict accordance with manufacturer's directions for the applicable materials and surface before using.

2. Coatings shall be delivered to the job site in the original unopened containers, bearing the manufacturer's label. A Product Data Sheet and Safety Data Sheets for all coatings shall be obtained from the Manufacturer for each shipment of materials to the job site. Coatings shall be stored in a dry, well-ventilated area, not in direct contact with the ground, where the temperature is maintained within the Manufacturer’s written recommended limits.

3. Damaged materials and/or materials exceeding the shelf life shall not be used.

4. The Contractor will be responsible for storing coatings onsite in accordance with the Manufacturer’s latest written recommendations.

5. Coatings shall be mixed in proper containers of adequate capacity. All coatings shall be mixed in accordance with the Manufacturer’s latest written recommendations. No unauthorized thinners or other materials shall be added to any coatings. Air shall not be used directly for agitation. Pigmented material shall be strained after mixing. Catalyzed materials may not be used beyond the recommended pot life.

6. Owner may request a notarized statement from Contractor detailing all materials used on the project.

7. Work areas will be designated by the Owner for storage and mixing of all materials. Materials shall be in full compliance with the requirements of pertinent codes and fire regulations. Proper containers outside of the buildings shall be provided and used for wastes, and no plumbing fixture shall be used for this purpose.

8. Contractor will be responsible for disposal of all waste, empty containers, etc.

9. Coating shall be performed in strict accordance with the safety recommendations of the coating manufacturer; with the safety recommendations of the national Association of Corrosion Engineers contained in the publication, Manual for Painter Safety; Federal, state and local agencies having jurisdiction.

G. FIELD CONDITIONS

1. All coatings shall be applied in dry and dust-free environment.

2. No coating shall be applied when temperatures are outside the manufacturers written recommended limits.

rain, fog, or mist.

3. No coating shall be applied when the temperature is less than 5°F above the dew point.

4. No coating shall be applied when unsuitable environmental conditions are expected within 1 hour of the listed “Dry to Touch” time for a coating.

5. The Contractor's scaffolding shall be erected, maintained and dismantled without damage to structures, machinery, equipment or pipe. Drop cloths shall be used as needed to protect buildings and equipment.

6. All surfaces required to be clear for visual observation shall be cleaned prior to inspection.

7. Painting shall not be performed on insulated pipe within three (3) feet of insulation operations or on insulation whose covering and surface coat have not had time to set and dry. Painting shall not be performed on uninsulated pipe within one (1) foot of any type of connection until the connection has been made, except as directed by the Owner.

PART 5 - PRODUCTS

5.01 GENERAL

Products containing lead will not be allowed. Oil shall be pure boiled linseed oil.

5.02 MANUFACTURER

A. Products shall be as manufactured by Tnemec Company, Inc., PPG or approved equal.

5.03 COATING PERFORMANCE CRITERIA

A. The following shall serve as a basis of comparison for material substitution requests. Any substitutions which decrease the total film thickness, change the generic type of coating, or fail to meet the performance criteria of the specified materials shall not be approved.

1. Series 1 Omnithane - Zinc/Micaceous Iron Oxide Urethane:

   a. Adhesion: ASTM D4541 (Method B, Type II) - No less than 1,433 psi (9.88 MPa) adhesion, average of three tests.

   b. Immersion: ASTM D870 – No blistering, cracking, rusting or delamination of film after 2,000 hours continuous immersion in deionized water at 140°F.

   c. Salt Spray (Fog): ASTM B117 - No blistering, cracking or delamination of film. No more than .03% rusting on plane and no more than 3/16" rust creepage at scribe after 10,000 hours exposure.

2. Series 21 Epoxoline – Modified Polyamine Epoxy:

   a. Special Qualification: Meets the requirements of approval for potable water use as established by NSF Std 600 for tanks and reservoirs of 20,000 gallons capacity or greater (max thickness: 20.0 mils).

   b. Adhesion: ASTM D4541 (Type V Tester) – No less than 1,840 psi (12.68 MPa) adhesion, average of three trials.

   c. Cyclic Salt Fog / UV Exposure: ASTM D5894 – No blistering, cracking, rusting or delamination of the film after 9,744 hours (29 cycles) of cyclic salt fog/UV cycling.

   d. Dielectric Strength: ASTM D149 – No less than 927 V/mil dielectric strength, average of five trials.

   e. Prohesion: ASTM G85 – No blistering, cracking, rusting or delamination of the film and no rust creepage at the scribe after 10,000 hours exposure.

f. Salt Spray (Fog): ASTM B117 (2 Coats Series 21) - No blistering, cracking, rusting or delamination of the film and no rust creepage at the scribe after 10,000 hours exposure.

3. Series 22 Epoxoline – Modified Polyamine Epoxy

a. Special Qualification: Meets the requirements of approval for potable water use as established by NSF Std 600 for tanks and reservoirs of 50 gallons capacity or greater (Max thickness: 50.0 mils).

b. Special Qualification: Meets the requirements set forth in AWWA C210-07 testing.

c. VOC Content: 0.10 lbs/gallon (12 grams/litre)

d. Adhesion: ASTM D4541 (Type V Tester) – No less than 1,765 psi (12.17 MPa) pull, average of three tests.

e. Cyclic Salt Fog / UV Exposure: ASTM D5894 – No rusting, blistering, cracking or delamination of film after 5,000 hours exposure.

f. Dielectric Strength: ASTM D149 – No less than 559 volts/mil dielectric strength, average of six tests.

g. Immersion: ASTM 870 – No blistering, cracking, rusting or delamination of film after 2,000 hours continuous immersion in deionized water at 140°F (60°C), average of three tests.

h. Salt Spray (Fog): ASTM B117 – No blistering, cracking, rusting or delamination of film after 10,000 hours exposure, average of two panels.

4. Series 46H-413 Hi-Build Tneme-Tar – Polyamide Epoxy-Coal Tar:

a. Adhesion: ASTM D4541 (Steel) – No less than 1,150 psi (7.93 MPa) pull, average of three tests.

b. Adhesion: ASTM D4541 (Concrete) - Exceeds the cohesive strength of the concrete substrate (400 psi), average of three tests.

c. Abrasion: ASTM D4060 (CS-17 wheel, 1,000 gram load) - No more than 142 mg loss after 1,000 cycles.

d. Salt Spray (Fog): ASTM B117 - No blistering, cracking, checking, rusting or delamination of film. No rust creepage at scribe after 9,000 hours continuous exposure.

5. Series 61 Tneme-Liner – Cycloaliphatic Amine Epoxy:

a. Chemical Immersion: NACE TM-01-74, Procedure B – No blistering, cracking, rusting or delamination of film after six months continuous immersion.

b. Immersion: ASTM D870 - No blistering, cracking or delamination of film after 12 months continuous immersion in deionized water at 200°F (93°C).

6. Series N69 Hi-Build Epoxoline II – Polyamidoamine Epoxy:

a. Adhesion: ASTM D4541 – No less than 1,943 psi (13.40 MPa) pull, average of three tests.

b. Exterior Exposure: ASTM D1014 - No blistering, cracking, checking, rusting or delamination of film. No rust creepage at scribe after 5

years exposure.

c. Humidity: ASTM D4585 - No blistering, cracking, checking, rusting or delamination of film after 10,000 hours exposure.

d. Immersion: ASTM D870 - No blistering, cracking, rusting or delamination of film after 2,000 hours continuous immersion in deionized water at 140°F, average of three tests.

e. Prohesion: ASTM G85 – No blistering, cracking, checking, rusting or delamination of film. No more than 1/8" rust creepage at scribe after 5,000 hours exposure.

f. Salt Spray: ASTM B117 (2 Coats Series N69) - No blistering, cracking or delamination of film. No more than 1% rusting on plane. No more than 1/16" rust creepage at scribe after 6,700 hours exposure.

g. Salt Spray: ASTM B117 (Series 90-97 with 2 Coats Series N69) - No blistering, cracking, rusting or delamination of film. No more than 1% rusting on plane. No more than 3/16" rust creepage at scribe after 20,000 hours exposure.

7. Series 90-97 Tneme-Zinc – Aromatic Zinc-Rich Urethane:

a. Zinc Pigment: 83% by weight in dried film

b. Adhesion: ASTM D4541 (Type II) - No less than 1,516 psi (10.46 MPa) adhesion, average of three tests.

c. Adhesion: ASTM D4541 (Type V) – No less than 2,083 psi (14.36 MPa) adhesion, average of three tests.

d. Prohesion: ASTM G85 – No blistering, cracking or delamination of film. No more than 1/64" rust creepage at scribe after 15,000 hours exposure.

e. Salt Spray: ASTM B117 - No blistering, cracking or delamination of film. No more than 1/8" creepage at scribe and no more than 1% rusting on plane after 50,000 hours exposure.

8. Series 104 HS Epoxy – Cycloaliphatic Amine Epoxy:

a. Adhesion: ASTM D4541 (Steel) – No less than 900 psi (6.21 MPa) pull, average of three tests.

b. Adhesion: ASTM D4541 (Concrete) – No less than 400 psi (2.76 MPa) pull, average of three tests.

c. Chemical Immersion: NACE TM-01-74, Procedure B – No blistering, cracking or delamination of film after seven days (Contact Tnemec for complete list).

d. Salt Spray (Fog): ASTM B117 - No blistering, cracking, rusting or delamination of film. No more than 1/32" (.8 mm) rust creepage at scribe after 1,500 hours exposure.

9. Series 113 Tneme-Tufcoat – Waterborne Acrylic Epoxy:

a. Adhesion: ASTM D4541 - No less than 380 psi (2.6 MPa) pull, average of three tests (applied directly to concrete block).

b. Humidity: ASTM D2247 - No blistering, cracking or delamination after 1,000 hours exposure.

c. Scrubbability: ASTM D4213 – After 1,000 cycles, less than .8 mils (20.3 microns) removed and less than 2 units gloss change. Erosion rate of dry film less than 25 micro-liters per 100 cycles.

10. Series N140 Pota-Pox Plus – Polyamidoamine Epoxy:

a. Adhesion: ASTM D4541 - No less than 1,943 psi (13.40 MPa) pull, average of three tests.

b. Exterior Exposure: ASTM D1014 - No blistering, cracking, checking, rusting or delamination of film. No rust creepage at scribe after 5 years exposure.

c. Humidity: ASTM D4585 - No blistering, cracking or delamination of film after 10,000 hours exposure.

d. Immersion: ASTM D870 - No blistering, cracking, rusting or delamination of film after 2,000 hours continuous immersion in deionized water at 140°F, average of three tests.

e. Prohesion: ASTM G85 – No blistering, cracking, checking, rusting or delamination of film. No more than 1/8" rust creepage at scribe after 5,000 hours exposure.

f. Salt Spray (Fog): ASTM B117 (2 Coats Series N140) - No blistering, cracking or delamination of film. No more than 1% rusting on plane. No more than 1/16" rust creepage at scribe after 6,700 hours exposure.

g. Salt Spray (Fog): ASTM B117 (Series 91H_2O and 2 Coats Series N140) - No blistering, cracking, checking or delamination of film. No more than 1% rusting on plane and no more than 3/16" rust creepage at scribe after 20,000 hours exposure.

11. Series 156 Enviro-Crete – Modified Waterborne Acrylate:

a. Adhesion: ASTM D7234 – Exceeds the cohesive strength of concrete substrate (400 psi), average of three tests.

b. Fungal/Mold/Mildew Resistance: ASTM D3273 – No More than slight mold growth after five weeks exposure.

c. QUV Exposure: ASTM D4587 (UVA-340 bulbs, 8 hours UV, 4 hours condensation) - No blistering, cracking, chalking or delamination of the film. No less than 69% gloss retention, no more than 1.1 units gloss loss, and no more than 3.59 DE (FMC-2) color change (white) after 5,000 hours QUV exposure.

d. Salt Spray: ASTM B117 - No blistering, cracking or delamination of film. No visible damage to coating or substrate after 5,000 hours.

e. Tensile Strength, Elongation, Modulus of Elasticity: ASTM D2370 - Elongation no less than 200 percent, average of five tests. Tensile strength no less than 250 psi (1.7 MPa), average of three tests.

f. Wind Driven Rain Resistance: TT-C-555B (Formerly FED TT-C-555B), Section 4.4.7.3 - No damage to coating or substrate. No visible moisture on the back of lightweight block after 48 hours exposure.

12. Series 222 Deco-Tread – Colored Quartz-Filled Modified Polyamine Epoxy:

a. Coefficient of Friction: ASTM D2047 – 1.2 static coefficient of friction,

average of 12 tests.

b. Compressive Strength: ASTM C579 - 15,567 psi (107.33 MPa) compressive strength.

c. Flexural Strength and Modulus of Elasticity: ASTM D790 - No less than 2,867 psi (19.77 MPa) flexural strength and 127,876 psi (881.67 MPa) flexural modulus of elasticity, average of five tests.

d. Tensile Strength: ASTM C307 - 2,100 psi (14.5 MPa) tensile strength, average of three tests.

e. Thermal Expansion: ASTM C531 - No more than 1.85 x 10-5 linear coefficient of thermal expansion per °F, average of two rounds of six tests.

13. Series 241 Ultra-Tread MVT – Polyurethane Modified Concrete:

a. Can be applied to 10 day old concrete

b. Withstands moisture vapor transmission up to 20 lbs. per ASTM F1869

c. Withstands relative humidity up to 99% per ASTM F2170

d. Adhesion: ASTM D7234 - Exceeds the cohesive strength of the concrete substrate (˜400 psi), average of three tests.

e. Compressive Strength: ASTM C579 - No less than 4,922 psi (33.94 MPa) compressive strength, average of six tests.

f. Flexural Strength and Modulus of Elasticity: ASTM C580 - No less than 2,438 psi (16.81 MPa) flexural strength and 313,614 psi (2,162 MPa) modulus of elasticity (tangent), average of five tests.

g. Tensile Strength: ASTM C307 - No less than 1,015 psi (7.00 MPa) tensile strength, average of six tests.

14. Series 257 Excellathane SS – Modified Aliphatic Polyaspartic:

a. Abrasion: ASTM D4060 (CS-17 Wheel, 1,000 grams load) – No more than 39 mg loss after 1,000 cycles with 1,000 gram load, average of three tests.

b. Hardness: ASTM D2240 – No less than 69 Shore Type D hardness, average of five tests.

c. Impact: MIL D3134 – No more than 1/16" permanent indentation. No cracking, checking or delamination of the film after 240 in-lb (27 J) direct impact, average of three tests.

d. QUV Exposure: ASTM D4587 (Over Series 700) – No blistering, cracking, chalking or delamination of the film. No less than 94% gloss retention, no more than 5.8 units gloss loss, and no more than 0.41 DE00 color change after 500 hours QUV exposure.

e. Rate of Burning: Self-extinguishing (HB Classification), average of ten tests.

f. Water Absorption: ASTM C413 – No more than a 0.0194 grams of water absorption, average of six tests.

g. Water Vapor Transmission: ASTM D1653 (Method B Wet Cup, Condition C) – No more than 7.68 g/m^2 per 24h water vapor

transmission, and no more than 0.56 perms (0.37 metric perms) water vapor permeance, average of three trails.

15. Series 700 Hydroflon – Advanced Thermoset Solution Fluoropolymer:

    a. Exterior Exposure: AAMA 2605 (South Florida Marine Exposure) – Exceeds the exterior weathering requirements of the American Architectural Manufacturers Association (AAMA) 2605 standard.

    b. Exterior Exposure: AAMA 2604 (South Florida Marine Exposure) – Exceeds the exterior weathering requirements of the American Architectural Manufacturers Association (AAMA) 2604 standard.

    c. Exterior Exposure: ASTM D4141, Method C (EMMAQUA) – No blistering, cracking, chalking or delamination. No less than 80% gloss retention and no more than 0.18 DE00 (DEHunter 0.29) color change after 5,000 MJ/m^2 of UV exposure (166,820 MJ/m^2 total).

    d. QUV Exposure: ASTM D4587 - No blistering, cracking or chalking. No less than 61% gloss retention (31.4 units gloss change) and 1.89 DEFMC2 (MacAdam units) color change (white) after 25,000 hours exposure.

    e. Xenon Arc Weathering: ASTM D6695 - No blistering, cracking or chalking. No less than 87% gloss retention (11.9 units gloss change) and no greater than 0.37 DE00 color change (white) after 8,000 hours Xenon Arc exposure.

16. Series 1094 Endura-Shield – Aliphatic Acrylic Polyurethane:

    a. Volatile Organic Compounds (Thinned 15%): 0.80 lbs/gallon (96 grams/litre)

    b. Cyclic Salt Fog / UV Exposure: ASTM D5894 – No blistering, cracking, rusting or delamination of film after 5,000 hours (15 cycles) of cyclic salt fog/UV cycling.

    c. Hardness: ASTM D3363 – No less than 3B scratch hardness after 30 days cure.

    d. Prohesion: ASTM G85 – No blistering, cracking, rusting or delamination of film and no rust creepage at the scribe after 3,000 hours of exposure.

    e. QUV Exposure: ASTM D4587 (UVA-340 bulbs, 8 hours UV, 4 hours condensation) - No blistering, cracking or delamination of film. No less than 80% gloss retention, no more than 16 units gloss loss and no more than 1.89 DECIE2000 color change after 4,000 hours QUV exposure

17. Series 1095 Endura-Shield – Aliphatic Acrylic Polyurethane:

    a. Volatile Organic Compounds (Thinned 15%): 0.80 lbs/gallon (96 grams/litre)

    b. Cyclic Salt Fog / UV Exposure: ASTM D5894 – No blistering, cracking, rusting or delamination of film or creepage at the scribe after 5,376 hours of exposure.

    c. Hardness: ASTM D3363 – No gouging or scratching with an HB or less pencil.

d. Prohesion: ASTM G85 – No blistering, cracking, rusting or delamination of film after 5,000 hours exposure.

e. QUV Exposure: ASTM D4587 (UVA-340 bulbs, 8 hours UV, 4 hours condensation) - No blistering, cracking or delamination. No less than 58% gloss retention or 15.2 units gloss change and 1.40 DECIE2000 color change (white) after 4,000 hours exposure.

18. Series 1096 Endura-Shield – Aliphatic Acrylic Polyurethane:

a. Volatile Organic Compounds (Thinned 10%): 0.69 lbs/gallon (82 grams/litre)

b. Cyclic Sale Fog/ UV Exposure: ASTM D5894 - No blistering, cracking, rusting or delamination of film after 5,000 hours (15 cycles) of cyclic salt fog/UV cycling.

c. Hardness: ASTM D3363 – No less than H scratch hardness after 30 days cure.

d. Prohesion: ASTM G85 – No blistering, cracking, rusting or delamination of film and no rust creepage at the scribe after 1,500 hours of exposure.

e. QUV Exposure: ASTM D4587 (UVA-340 bulbs, 8 hours UV, 4 hours condensation) - No blistering, cracking or delamination of the film. No less than 57% gloss retention, no more than 3.2 units gloss loss, and no more than 1.71 DECIE 2000 color change after 5,000 hours QUV exposure.

f. Salt Spray (Fog): ASTM B117 - No blistering, cracking, rusting or delamination of film and no rust creepage at the scribe after 2,500 hours of continuous salt spray exposure.

5.04 COLORS

A. Refer to Utilities Division Color Coding guidance found in Appendix A

B. Formulate with colorants free of lead, lead compounds, or other materials which might be affected by presence of hydrogen sulfide or other gas likely to be present at the project.

C. Proprietary identification of colors if for identification only. Any authorized manufacturer may supply matches.

5.05 TESTING GAUGES

A. Furnish a magnetic type dry film thickness gauge, to test coating thickness specified in mils, as manufactured by:

1. Nordson Corp., Anaheim, CA, Mikrotest

2. Or equal

B. Furnish an electrical holiday detector, low voltage, wet sponge type to test finish coat, except zinc primer, high-build elastomeric coatings, and galvanizing, for holidays and discontinuities as manufactured by:

1. Tinker and Rasor, San Gabriel, CA, Model M-1

2. Or equal

C. Furnish a high voltage holiday detector for elastomeric coatings in excess of 25 mils dry film thickness. Unit to be as recommended by the coatings manufacturer.

5.06 PRODUCT SUBSTITUTIONS

A. Proposed product substitutions may be considered. A complete submittal by the alternate manufacturer must be received by the Engineer. To be complete, the submittal must contain the following:

1. A letter on Manufacture letterhead which explains why the proposed product substitution meets or exceeds every paragraph of this specification.

2. Manufacturer's literature for each product giving the name, generic type, descriptive information and evidence of satisfactory past performance.

3. Independent laboratory certification that their product meets or exceeds the performance criteria of the specified materials.

4. An installation list and references for a minimum of 20-years of similar applications.

PART 6 - EXECUTION

6.01 CLEANING AND PROTECTION

A. It shall be the responsibility of the Contractor to protect at all times, in areas where painting is being done, floors, materials of other crafts, equipment, vehicles, fixtures, and finished surfaces adjacent to paint work. Cover all electric plates, surface hardware, nameplates, gauge glasses, etc., before start of painting work.

B. At the option of the Owner during the course of this project, the Contractor will contain all spent abrasives, old paint chips, paint overspray and debris by means suitable to the Owner, including, but not limited to, full shrouding of the area.

C. If shrouding is required, the Contractor must provide a complete design of the intended shroud or cover. Care must be taken not to modify or damage the structure during the use of the shroud. If damage should occur, the Contractor is held responsible for all repairs.

D. At completion of the work, remove all paint where spilled, splashed, spattered, sprayed or smeared on all surfaces, including glass, light fixtures, hardware, equipment, painted and unpainted surfaces.

E. After completion of all painting, the Contractor shall remove from job site all painting equipment, surplus materials and debris resulting from this work.

F. The Contractor is responsible for the removal and proper disposal of all hazardous materials from the job site in accordance with Local, State and Federal requirements as outlined by the Environmental Protection Agency.

G. A notarized statement shall be presented to the Owner that all hazardous materials have been disposed of properly including, but not limited to: name of disposal company, disposal site, listing of hazardous materials, weights of all materials, cost per pound and EPA registration number.

6.02 ENVIROMENTAL CONDITIONS

A. Coatings shall not be applied in temperature exceeding the manufacturer's recommended maximum and minimum allowable, nor under adverse conditions such as dust, smoke-laden atmosphere, damp or humid weather.

6.03 PREPARATION OF SURFACES

A. All surfaces to be coated shall be prepared as specified herein and shall be dry and clean before coating. Specific surface preparation shall be specified for the individual

coating systems.

B. The surface shall be cleaned as specified for the paint system being used. All cleaning shall be as outlined in the Society for Protective Coatings Surface Preparation Specification, unless otherwise noted. If surfaces are subject to contamination, other than mill scale or normal atmospheric rusting, the surfaces shall be pressure washed, and acid or caustic pH residues neutralized, in addition to the specified surface preparation.

C. Standards for Surface Preparation

1. SSPC-SP1: Solvent Cleaning: Remove all grease, oil, salt, acid, alkali, dirt, dust, wax, fat, foreign matter and contaminates, etc. by one of the following methods: steam cleaning, alkaline cleaning, or volatile solvent cleaning.

2. SSPC-SP2: Hand Tool Cleaning: Removal of loose rust, loose mill scale and loose paint to a clean sound substrate by hand chipping, scraping, sanding and wire brushing.

3. SSPC-SP3: Power Tool Cleaning: Removal of loose rust, loose mill scale and loose paint to a clean sound substrate by power tool chipping, descaling, sanding, wire brushing and grinding.

4. SSPC-SP5/NACE No.1: White Metal Blast Cleaning: Complete removal of all mill scale, rust, rust scale, previous coating, etc., leaving the surface a uniform gray-white color.

5. SSPC-SP6/NACE No.3: Commercial Blast Cleaning: Complete removal of all dirt, rust scale, mill scale, foreign matter and previous coating, etc., leaving only shadows and/or streaks caused by rust stain and mill scale oxides. At least 66% of each square inch of surface area is to be free of all visible residues, except slight discoloration.

6. SSPC-SP7/NACE No.4: Brush-Off Blast Cleaning: Removal of rust scale, loose mill scale, loose rust and loose coatings, leaving tightly-bonded mill scale, rust and previous coatings. On concrete surfaces, brush-off blast cleaning shall remove all laitance, form oils and solid contaminates. Blasting should be performed sufficiently close to the surface so as to open up surface voids, bugholes, air pockets and other subsurface irregularities, but so as not to expose underlying aggregate.

7. SSPC-SP10/NACE No.2: Near-White Blast Cleaning: Removal of all rust scale, mill scale, previous coating, etc., leaving only light stains from rust, mill scale and small specks of previous coating. At least 95% of each square inch of surface area is to be free of all visible residues and the remainder shall be limited to slight discoloration.

8. SSPC-SP11: Power Tool Cleaning to Bare Metal: Complete removal of rust, rust scale, mill scale, foreign matter and previous coatings, etc., to a standard as specified on a Commercial Grade Blast Cleaning (SSPC-SP-6, NACE-3) by means of power tools that will provide the proper degree of cleaning and surface profile.

    a. SSPC-SP13/NACE No.6: Surface Preparation of Concrete: Provides requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems.

9. International Concrete Restoration Institute (ICRI):

a. ICRI 310.1R - Exposed Reinforcing bar (Rebar) Repair

b. ICRI-CSP 1 – 10: Concrete Surface Profiles 1 through 10

10. SSPC-SP14/NACE No.8: Industrial Blast Cleaning: An industrial blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, and dirt. Traces of tightly adherent mill scale, rust, and coating residues are permitted to remain on 10% of each unit area of the surface if they are evenly distributed.

11. SSPC-SP15: Commercial Grade Power Tool Cleaning: A commercial grade power tool cleaned steel surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter, except as noted. Random staining shall be limited to no more than 33% of each unit area of surface as defined.

12. SSPC-SP16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steel, and Non-Ferrous Metals: brush-off blast cleaned non-ferrous metal surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, metal oxides (corrosion products), and other foreign matter. Intact, tightly adherent coating is permitted to remain. Bare metal shall have a uniform angular anchor profile of at least 0.75 mils.

13. SSPC-SP18: Thorough Spot and Sweep Blast Cleaning for Industrial Coating Maintenance: A thorough spot and sweep blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, and dirt. Areas of exposed steel shall be cleaned to near white metal level (Reference SSPC-SP10). Retained coatings shall have no visible chalk, cracks, blisters, residual corrosion staining, delamination, or other defects after the blasting, and shall be uniformly roughened. Retained existing coating shall have sufficient adhesion that it cannot be removed by lifting with a dull putty knife. No loose or lifted edges may remain.

14. Visual standards "Pictorial Surface Preparation Standards for Painting Steel Surfaces", and the National Association of Corrosion Engineer, "Blasting Cleaning Visual Standards" TM-01-70 and TM-01-75 shall be considered as standards for proper surface preparation.

15. NAPF 500-03-04:

    a. Internal Pipe Surface: When viewed without magnification, the internal surfaces shall be free of all visible dirt, dust, annealing layer, rust, mold, coatings, and other foreign matter. Random staining and tightly adhered annealing oxide residue shall be limited to no more than 5%.

    b. External Pipe Surface: When viewed without magnification, the exterior surfaces shall be free of all visible dirt, dust, loose annealing oxide, rust, mold, coatings, and other foreign matter.

16. NAPF 500-03-05: Fitting Blast Clean #2: When viewed without magnification, no more than 5% staining may remain on the surface and the exterior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold, coatings, and other foreign matter.

17. Oil, grease, soil, dust, etc., deposited on the surface preparation that has been completed shall be removed prior to painting according to SSPC-SP1 Solvent Cleaning.

18. Weld flux, weld spatter and excessive rust scale shall be removed by Power

Tool Cleaning as per SSPC-SP11-87T.

19. All weld seams, sharp protrusions, and edges shall be ground smooth prior to surface preparation or application of any coatings.

20. All areas requiring field welding shall be masked off prior to shop coating, unless waived by the Engineer.

21. All areas which require field touch-up after erection, such as welds, burn backs, and mechanically damaged areas, shall be cleaned by thorough Power Tool as specified in SSPC-SP11-87T.

22. Touch-up systems will be same as original specification except that approved manufacturer's organic zinc-rich shall be used in lieu of inorganic zinc where this system was originally used. Also strict adherence to manufacturer's complete touch-up recommendations shall be followed. Any questions relative to compatibility of products shall be brought to the Engineer's attention; otherwise, Contractor assumes full responsibility.

23. Steel shall be blasted unless otherwise specified. Blasting shall be done with a centrifugal wheel or compressed air blasting equipment, using proper abrasives to attain an average profile depth of 1.5 mils. Do not re-use sand or flint abrasives. Short abrasives must be thoroughly clean of contamination before re-use. Blow dust and grit from surface with clean, dry air. Coat within 8 hours or before rust contamination occurs.

24. All concrete shall have cured for 28 days unless otherwise specified.

25. When specified, the surface shall be pretreated in accordance with the specified pretreatment prior to application of the prime coat of paint.

6.04 COATING SYSTEMS

A. Paint systems in this article are based on "MPI Manual." For renovation projects, consult "MPI Maintenance Repainting Manual" and revise paint systems accordingly.

B. Refer to Paragraph 3.03 for general surface preparation guidelines.

C. All surface preparation listed within this section is to be performed in addition to the surface preparation listed in Article 3.3.

D. General (Stripe Coating, Inaccessible Areas, Touch-Ups):

1. Surfaces that will be inaccessible after assembly shall receive either the full specified paint system or three shop coats of the specified Primer/1st Coat before assembly.

2. All edges and weld seams in immersion service shall receive a "stripe coat" (applied by brush) of the 2nd coat prior to application of the full 2nd coat.

3. All open seams in the roof area of storage tanks shall be filled after application of the final coat with a flexible sealant that is suitable for the exposure.

4. Touch-Up and Touch-Up Materials:

a. All areas which require field touch-up after erection, such as welds, burnbacks, and mechanically damaged areas, shall be prepared per the Manufacturer's latest written recommendations.

b. Strict adherence to manufacturer's complete touch-up recommendations shall be followed. Any questions relative to compatibility of products shall be brought to the Owner and Manufacturer's attention. Otherwise, Contractor assumes full

responsibility.

c. The Contractor shall provide, at the end of the Project, at least one (1) gallon of each generic topcoat in each color as specified by the Owner for future touch-up. Two gallons may be required for (2) component materials.

E. EXTERIOR FERROUS METAL, STEEL AND DIP – UV EXPOSED, NON-IMMERSION, ABOVE GRADE, RE-PAINT:

1. Option 1 – TNEMEC System No. 700-1: Zinc/Urethane/Fluoropolymer

a. This system must provide outstanding resistance to ultra-violet light degradation and the absolute best color and gloss retention available. This system shall have excellent resistance to abrasion and chalking, and is recommended for coastal environments and on structures where extremely long-term maintenance cycles are desired (such as elevated tanks and surfaces with custom artwork).

b. Surface Preparation: New Construction - SSPC-SP6/NACE No.3 Commercial Blast Cleaning with a minimum 1.5 mil angular anchor profile. Re-paint – Spot SSPC-SP1 and SP3, SSPC/NACE #4 for remainder.

c. Primer: Series 90-97 Tneme-Zinc @ 2.5 - 3.5 mils

d. 2nd Coat: Series N69 Hi-Build Epoxoline @ 2.0 - 6.0 mils

e. 3rd Coat: Series 1095 Endura-Shield @ 2.0 - 5.0 mils

f. 4th Coat: Series 700 Hydroflon @ 2.0 - 3.0 mils (Specify 700 for gloss, 701 for semi-gloss)

g. Total Dry Film Thickness: 8.5 - 17.5 mils

h. Minimum Dry Film Thickness: 10.0 mils

i. Note: for re-paint conditions, the above system may be reduced in accordance with the manufacturer's recommendations after inspecting the project.

2. Option 2 – PPG PSX 700

a. This system must provide outstanding resistance to ultra-violet light degradation and the absolute best color and gloss retention available. This system shall have excellent resistance to abrasion and chalking, and is recommended for coastal environments and on structures where extremely long-term maintenance cycles are desired (such as elevated tanks and surfaces with custom artwork).

b. Surface Preparation: New Construction - SSPC-SP6/NACE No.3 Commercial Blast Cleaning with a minimum 1.5 mil angular anchor profile. Re-paint – Spot SSPC-SP1 and SP3, SSPC/NACE #4 for remainder.

c. Spot-Amerilock 400 / Series 2 @ 4.0 - 6.0 mils

d. Full-Amerilock 400 / Series 2 @ 4.0 - 6.0 mils

e. PPG PSX 700 @ 3.0 - 5.0 mils

f. Colored Surface Areas - PPG PSX 700 @ 3.0 - 5.0 mils

g. Total Dry Film Thickness: 10.0-22.0 mils

h. Minimum Dry Film Thickness: 10.0 mils

i. Note: for re-paint conditions, the above system may be reduced in accordance with the manufacturer's recommendations after inspecting the project.

F. EXTERIOR FERROUS METALS, STEEL AND DIP – BELOW GRADE:

1. System No. N69-1: Epoxy/Epoxy/Epoxy or Urethane

a. This system provides exceptional corrosion protection in buried environments. It offers better corrosion protection and a healthier application process than coal-tar epoxies. The 3rd coat is dependent on the exposure – for buried areas use an extra coat of high-solids epoxy, for UV-exposed, non-immersion areas use an aliphatic acrylic urethane. Series 1094 has a gloss finish. For a different sheen, apply Series 1095 (semi-gloss) or Series 1096 (eggshell) at the same thickness.

b. Surface Preparation: SSPC-SP10/NACE No. 2 Near-White Blast Cleaning with a minimum angular anchor profile of 1.5 mil

c. Shop Coat: Series N140 or Series N69 @ 2.0 – 10.0 mils

d. 2nd Coat: Series N69 Hi-Build Epoxoline @ 4.0 - 10.0 mils

e. 3rd Coat (Buried Areas Only): Series N69 Hi-Build Epoxoline @ 4.0 - 10.0 mils

f. 3rd Coat (UV Exposed, Non-immersion Areas Only): Series 1094 @ 2.5 - 5.0 mils

g. Total Dry Film Thickness: 10.0 – 30.0 mils

h. Minimum Dry Film Thickness: 11.0 mils

G. Exterior Ferrous Metals, Steel and DIP - Above Grade, Misc. Metals.

1. System No. 1094-3: Epoxy Mastic/Urethane (Overcoat)

a. This system can be used over factory finish paint or over non-sandblasted steel and offers the high performance of an epoxy/urethane system. Series 1094 has a gloss finish. For a different sheen, apply Series 1095 (semi-gloss) or Series 1096 (eggshell) at the same thickness. Note: It is recommended Tnemec be contacted for an overcoat evaluation prior to specifying an overcoat system.

b. Surface Preparation: High Pressure Water Clean (min. 3500 psi, 3 to 5 gallons per minute, using an oscillating tip and potable water). A cleaning detergent such as Trisodium Phosphate should be used to facilitate cleaning. A degreaser may be required for oil soaked areas or heavily contaminated areas.

c. Some spot areas may require Hand Tool (SSPC-SP2), Power Tool Cleaning (SSPC-SP3), or Brush Blast (SSPC-SP7/NACE No. 4) to remove loose surface rust.

d. Existing coatings must be clean, dry, and tightly adhering prior to application of coatings.

e. Spot Prime (Areas of Bare Steel): Series 135 Chembuild @ 4.0 – 6.0 mils

f. 1st Coat: Series 135 Chembuild @ 4.0 - 6.0 mils

g. 2nd Coat: Series 1094 Endura-Shield @ 2.0 - 5.0 mils

h. Total Dry Film Thickness: 6.0 - 11.0 mils*

H. Minimum Dry Film Thickness: 7.0 mils

I. EXTERIOR FERROUS METALS, STEEL, DIP – IMMERSION, NON-POTABLE, CORROSIVE:

1. System No. 104-1: Cycloaliphatic Amine Epoxy (Non-Potable Water)

a. This system will provide chemical and corrosion resistance for protection against moisture, corrosive fumes, chemical contact and immersion in mild to moderate wastewater, such as clarifiers, chlorine contact basins, aeration basins, settling basins and other open top (aerobic) structures. Shop coat must be touched-up before second coat is applied.

b. Surface Preparation: SSPC-SP10/NACE No.2 Near-White Blast Cleaning with a minimum 1.5 mil angular anchor profile.

c. Shop Coat: Series 1 Omnithane @ 2.5 - 3.5 mils

d. 2nd Coat: Series 104 Hi-Build Epoxoline @ 6.0 - 8.0 mils

e. 3rd Coat: Series 104 Hi-Build Epoxoline @ 6.0 - 8.0 mils

f. Total Dry Film Thickness: 14.5 - 19.5 mils

g. Minimum Dry Film Thickness: 15.5 mils

h. Allow Series 104 to cure for 7 days at 75°F prior to immersion service.

J. FERROUS METALS, STEEL, DIP – IMMERSION, POTABLE WATER

1. System No. 21-1: Polyamide Epoxy (Potable Water)

a. This system meets American Water Works Association AWWA D 102 Inside Coating System Number 5. Series 21 meets the requirements of approval for potable water use as established by NSF Std 600 for tanks and reservoirs of 20,000 gallons capacity or greater.

b. Surface Preparation: SSPC-SP10/NACE No.2 Near-White Blast Cleaning with a minimum angular anchor profile of 2.0 mils.

c. Shop Coat: Series 94H_2O Hydro-Zinc @ 2.5 – 3.5 mils

d. Stripe Coat (Weld Seams and Edges): Apply Series 21 by brush

e. 2nd Coat: Series 21 Epoxoline @ 6.0 - 10.0 mils

f. 3rd Coat: Series 21 Epoxoline @ 6.0 - 10.0 mils

g. Total Dry Film Thickness*: 14.5 - 23.5 mils**

h. Minimum Dry Film Thickness: 16.0 mils

i. *Total Dry Film Thickness excludes stripe coat

j. **In order to maintain NSF Std. 600 approval, maximum Series 21 DFT is 20 mils.

K. Allow Series 21 to cure for 7 days at 75°F prior to service.

L. EXTERIOR CONCRETE & MASONRY – ABOVE GRADE, UV-EXPOSED (NON-IMMERSION):

1. System No. 156-1: Modified Waterborne Acrylate (Elastomeric)

   a. This system provides a breathable elastomeric with exceptional elongation for spanning hairline cracks in concrete structures. It also provides mold & mildew resistance, as well as wind-driven rain resistance. If a textured finish is preferred, use 157 Enviro-Crete TX (medium texture) @ 6.0 – 9.0 mils dry film thickness per coat.

   b. Existing Conditions: Prior to coating, bare concrete shall have a "broom" or "rubbed" finish and be free of bugholes. If necessary, apply Tnemec Series 218 in accordance with the manufacturer's recommendations to achieve this finish.

   c. Surface Preparation: Allow concrete to cure for 28 days. Surface must be clean and dry.

   d. Block Filler (CMU only): 1254 Epoxoblock @ 100 – 150 ft^2/Gallon

   e. 1st Coat: Series 156 Enviro-Crete @ 4.0 - 8.0 mils

   f. 2nd Coat: Series 156 Enviro-Crete @ 4.0 - 8.0 mils

   g. Total Dry Film Thickness: 8.0 - 16.0 mils

   h. Minimum Dry Film Thickness: 10.0 mils

M. EXTERIOR CONCRETE & MASONRY – EXTERIOR, BELOW GRADE:

   a. System No. 46H-413-3: Polyamide Epoxy-Coal Tar

   b. This system provides a high-build coating for underground conditions.

   c. Surface Preparation: Allow new concrete to cure for 28 days. Surface shall be clean and dry.

   d. One or Two Coats: 46H-413 Hi-Build Tneme-Tar

   e. Total Dry Film Thickness: 16.0 - 20.0 mils*

N. INTERIOR CONCRETE & MASONRY – NON-IMMERSION:

1. System No. 113-1: Acrylic-Epoxy

   a. This system will provide high performance and can be applied directly over existing coatings without lifting. Can be used when low odor is required during application. Note: Series 113 has a Satin finish. For a gloss finish, specify Series 114 Tneme-Tufcoat.

   b. Existing Conditions: Prior to coating, bare concrete shall have a "broom" or "rubbed" finish and be free of bugholes. If necessary, apply Tnemec Series 218 in accordance with the manufacturer's recommendations to achieve this finish.

   c. Surface Preparation: Allow new concrete and masonry to cure for 28 days. Surface must be clean and dry.

   d. Block Filler (CMU only): Series 1254 Epoxoblock WB @ 100 – 150 ft^2/Gallon

   e. 1st Coat: 113 Tneme-Tufcoat @ 4.0 – 6.0 mils

   f. 2nd Coat: 113 Tneme-Tufcoat @ 4.0 – 6.0 mils

   g. Total Dry Film Thickness: 8.0 - 12.0 mils

h. Minimum Dry Film Thickness: 9.0 mils

O. EXTERIOR CONCRETE & MASONRY – IMMERSION, NON-POTABLE:

1. System No. 104-3: Cycloaliphatic Amine Epoxy (Non-Potable Water)

a. This system will provide chemical and corrosion resistance for protection against abrasion, moisture, corrosive fumes, chemical contact and immersion in mild to moderate Wastewater, such as clarifiers, chlorine contact basins, aeration basins, settling basins and other open top (aerobic) structures.

b. Surface Preparation: Allow new concrete to cure for 28 days. Mechanically abrade per SSPC-SP13/NACE No.6 to remove all laitance, fines, curing compounds, form release oils, and other contaminants, and to establish a surface profile equal to ICRI CSP 5 or greater on vertical surfaces, and an ICRI-CSP 3-5 surface profile on horizontal surfaces.

c. Surfacer / Patcher: Apply Tnemec Series 218 to all vertical surfaces at a minimum of 1/16" and as needed to bring all surfaces (vertical and horizontal) to level. Series 218 is to re-surface concrete, fill voids and bugholes, mitigate concrete outgassing, and to create a monolithic, paintable surface.

d. 1st Coat: Series 104 H.S. Epoxy (backrolled) @ 6.0 - 8.0 mils

e. 2nd Coat: Series 104 H.S. Epoxy @ 6.0 - 8.0 mils

f. 3rd Coat: Series 104 H.S. Epoxy @ 6.0 - 8.0 mils

g. Total Dry Film Thickness: 18.0 - 24.0 mils

h. Minimum Dry Film Thickness: 20.0 mils

i. Allow Series 104 to cure for 7 days at 75°F prior to immersion service.

P. EXTERIOR CONCRETE & MASONRY – IMMERSION, POTABLE:

1. System No. 21-2: Polyamide Epoxy (Potable Water)

a. This system meets American Water Works Association AWWA D 102 Inside Coating System No. 1. Series 21 meets the requirements of approval for potable water use as established by NSF Std 600 for tanks and reservoirs of 20,000 gallons capacity or greater.

b. Surface Preparation: Allow new concrete to cure for 28 days. Mechanically abrade per SSPC-SP13/NACE No.6 to remove all laitance, fines, curing compounds, form release oils, and other contaminants, and to establish a surface profile equal to ICRI CSP 5 or greater on vertical surfaces, and an ICRI-CSP 3-5 surface profile on horizontal surfaces.

c. Surfacer / Patcher: Apply Tnemec Series 218 to all vertical surfaces at a minimum of 1/16" and as needed to bring all surfaces (vertical and horizontal) to level. Series 218 is to re-surface concrete, fill voids and bugholes, mitigate concrete outgassing, and to create a monolithic, paintable surface.

d. 1st Coat: Series 21 @ 6.0 - 10.0 mils

e. 2nd Coat: Series 21 @ 6.0 - 10.0 mils

f. Total Dry Film Thickness: 12.0 - 20.0 mils*

g. Minimum Dry Film Thickness: 13.0 mils

h. *In order to maintain NSF Std. 600 approval, maximum allowable DFT is 20 mils. Allow Series 21 to cure for 7 days at 75°F prior to service

Q. INTERIOR CONCRETE FLOORS (RESINOUS FLOORING SYSTEMS):

1. System No. 222-1: Decorative Quartz Flooring (Decorative Non-Slip, Interior)

a. This system provides a decorative, chemical, abrasion, impact resistant, non-slip, seamless flooring system with a moisture mitigating base coat that resists up to 20 lbs of moisture vapor pressure, 99% relative humidity, and can be applied on 10-day old concrete. This floor utilizes clear resins, allowing for visibility of the quartz or other aggregate. For a solid-color floor, tint the 2nd and 3rd coats with Series 820 field tint.

b. Surface Preparation: Allow new concrete to cure for 10 days. Mechanically abrade in accordance with NACE No.6/SSPC-SP13 to provide a minimum surface profile equal to ICRI-CSP4-5.

c. 1st Coat: 241 Ultra-Tread MVT @ 70 ft^2 per small kit. Broadcast 1st Coat with Quartz or aggregate of choice.

d. 2nd Coat: 222 Deco-Tread @ 1/16", or about 80 ft^2 / gallon. Broadcast 2nd Coat with Quartz or aggregate of choice.

e. 3rd Coat: 257 Excellathane SS (clear) @ 8.0 - 16.0 mils, or 100-201 ft^2 / gallon

f. Minimum Dry Film Thickness: 1/8"

6.05 APPLICATION

A. Paint shall be applied only on thoroughly dry surfaces and during periods of favorable weather, unless otherwise allowed by the paint manufacturer. Except as provided below, painting shall not be permitted when the atmospheric temperature is below 50° F, or when freshly painted surfaces may be damaged by rain, fog, dust, or condensation, and/or when it can be anticipated that these conditions will prevail during the drying period.

B. No coatings shall be applied unless surface temperature is a minimum of 5° above dew point; temperature must be maintained during curing.

C. Mechanical mixers, capable of thoroughly mixing the pigment and vehicle together, shall mix the paint prior to use where required by manufacturer's instructions; thorough hand mixing will be allowed for small amounts up to one gallon. Pressure pots shall be equipped with mechanical mixers to keep the pigment in suspension, when required by manufacturer's instructions. Otherwise, intermittent hand mixing shall be done to assure that no separation occurs. All mixing shall be done in accordance with SSPC Vol. 1, Chapter 4, "Practical Aspects, Use and Application of Paints" and/or with manufacturer's recommendations.

D. Catalysts or thinners shall be as recommended by the manufacturer and shall be added or discarded strictly in accordance with the manufacturer's instruction.

E. No coatings shall be applied unless the relative humidity is below 85%.

F. Suitable enclosures to permit painting during inclement weather may be used if provisions are made to control atmospheric conditions artificially inside the

enclosure, within limits suitable for painting throughout the painting operations.

G. Field Painting in the immediate vicinity of, or on, energized electrical and rotating equipment, and equipment and/or pipes in service shall not be performed without the approval of the Engineer.

H. Extreme care shall be exercised in the painting of all operable equipment, such as valves, electric motors, etc., so that the proper functioning of the equipment will not be affected.

I. The Contractor's scaffolding shall be erected, maintained, and dismantled without damage to structures, machinery, equipment or pipe.

J. Drop cloths shall be used where required to protect buildings and equipment. All surfaces required to be clear for visual observations shall be cleaned immediately after paint application.

K. Painting shall not be performed on insulated pipe within three (3) feet of insulation operations or on insulation who's covering and surface coat have not had time to set and dry.

L. Painting shall not be performed on uninsulated pipe within one (1) foot of any type of connection until the connection has been made, except as directed by the Engineer.

M. The prime coat shall be applied immediately following surface preparation and in no case later than the same working day.

N. All paint shall be applied by brushing, paint mitt and roller, conventional spraying, or airless spraying, using equipment approved by the paint manufacturer.

O. Each coat of paint shall be recoated as per manufacturer's instructions. Paint shall be considered re-coatable when an additional coat can be applied without any detrimental film irregularities such as lifting or loss of adhesion.

P. Surfaces that will be inaccessible after assembly shall receive either the full specified paint system or three shop coats of the specified primer before assembly.

Q. Finish colors shall be in accordance with the COLOR SCHEDULE and shall be factory mixed (i.e., there shall be no tinting by the Contractor, unless authorized by the Engineer).

R. All edges and weld seams in immersion service shall receive a "stripe coat" (applied by brush) of the 1st coat prior to application of the full 1st coat.

S. All open seams in the roof area of tanks shall be filled after application of the topcoat with a flexible caulking such as Sika Flex 1A.

T. Top quality, properly styled brushes and rollers shall be used. Rollers with a baked phenol core shall be utilized.

U. The brushing or rolling shall be done so that a smooth coat as nearly uniform in thickness as possible is obtained. Brush or roller strokes shall be made to smooth the film without leaving deep or detrimental marks.

V. Surfaces not accessible to brushes or rollers may be painted by spray, by dauber or sheepskins, and paint mitt.

W. It may require 2 coats to achieve the specified dry film thickness if application is by brush and roller.

X. The equipment used shall be suitable for the intended purpose, shall be capable of properly atomizing the paint to be applied and shall be equipped with suitable pressure regulators and gauges.

Y. Paint shall be applied in a uniform layer, with a 50% overlap pattern. All runs and sags should be brushed out immediately or the paint shall be removed and the surface resprayed.

Z. High build coatings should be applied by a crosshatch method of spray application to ensure proper film thickness of the coating.

AA. Areas inaccessible to spray shall be brushed; if also inaccessible to brush, daubs or sheepskins shall be used, as authorized by the manufacturer.

BB. Special care shall be taken with thinners and paint temperatures so that paint of the correct formula reaches the receiving surface.

CC. Nozzles, tips, etc., shall be of sizes and designs as recommended by the manufacturer of the paint being sprayed.

DD. The first coat on concrete surfaces in immersion service should be sprayed and back rolled.

6.06 UNIDENTIFIED SURFACES

Any surfaces not specifically named in the schedule and not specifically accepted shall be prepared, primed and coated in the manner and with material consistent with these Specifications. The Engineer shall select which of the manufacturer's products, whether the type is indicated herein or not, shall be used for such unnamed surfaces. The painting shall be done within the scope of the contract.

6.07 WORKMANSHIP

A. On metal surfaces apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mil thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall built up to the same film thickness achieved with undiluted material. One gallon of paint as originally furnished by the manufacturer shall not cover a greater area when applied by spray gun than when applied unthinned by the application of an additional coat(s). On masonry, application rates will vary according to surface texture; however, in no case shall the manufacturer's stated coverage rate be exceeded. On porous surfaces, it shall be the painter's responsibility to achieve a protective and decorative finish either by decreasing the coverage rate or applying additional coats of paint.

B. All safety equipment shall be painted in accordance with OSHA Standards as approved.

C. Materials shall be mixed in proper containers of adequate capacity. All materials shall be thoroughly stirred before use and shall be kept stirred while using. No unauthorized thinners or other materials shall be added to any paint.

D. Only skilled painters shall be used on the work and specialists shall be employed where required.

E. Steel members, metal castings, mechanical and electrical equipment and other metals which are shop primed before deliver at the site will not require a prime coat on the job. All piping and other bare metals to be painted shall receive one coat of primer before exposure to the weather, and this prime coat shall be the first coat as specified in the painting schedule.

F. Finish surfaces shall not show brush marks or other irregularities. Undercoats shall be thoroughly and uniformly sanded with No. 00 sandpaper or equal to remove defects and provide a smooth, even surface.

G. Before final acceptance of the work, all damaged surfaces of coating shall be cleaned

and repainted as directed by the Engineer.

6.08 CLEANUP

A. It shall be the responsibility of the Contractor to collect and dispose of property, all waste materials from the site in accordance with all requirements of the Federal, state, and local environment protection agencies.

B. At completion of the work, remove all paint where it has been spilled, splashed, splattered, sprayed, or smeared on all surfaces, including glass, light fixtures, hardware, equipment, painted and unpainted surfaces.

C. It shall be the responsibility of the Contractor to protect at all times, in areas where painting is being done, floors, materials of other crafts, equipment, vehicles, fixtures, and finished surfaces adjacent to paint work. Cover all electric plates, surface hardware, nameplates, gauge glasses, etc., before start of painting work.

D. At the option of the Engineer during the course of this project, the Contractor will contain all spent abrasives, old paint chips, paint overspray and debris by means suitable to the Engineer, including but not limited to, full shrouding of the area.

E. If shrouding is required, the Contractor must provide a complete design of the intended shroud or cover. Care must be taken not to modify or damage the structure during the use of the shroud. If damage should occur, the Contractor is held responsible for all repairs.

F. At completion of the work, remove all paint where spilled, splashed, splattered, sprayed or smeared on all surfaces, including glass, light fixtures, hardware, equipment, painted, and unpainted surfaces.

G. After completion of all painting, the Contractor shall remove from job site all painting equipment, surplus materials, and debris resulting from this work.

H. The Contractor is responsible for the removal and proper disposal of all hazardous materials from the jobsite in accordance with Local, State, and Federal requirements as outlined by the Environmental Protection Agency.

I. A notarized statement shall be presented to the Engineer that all hazardous materials have been disposed of properly including but not limited to: name of Disposal Company, disposal site, listing of hazardous materials, weights of all materials, cost per pound and EPA registration number.

6.09 TOUCH-UP MATERIALS

A. The Contractor shall provide at the end of the project at least one (1) gallon of each generic topcoat in each color as specified by the Engineer for future touch-up. Two gallons may be required for (2) component materials.

6.10 MANUFACTURER'S SERVICE

Furnish paint manufacturer representative to visit job site at intervals during surface preparation and painting as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions and these specifications, and as may be necessary to resolve field problems attributable to, or associated with, manufacturer's products furnished under this Contract.

END OF SECTION

COATING SYSTEM DATA SHEET

(to be included with submittal)

Coating System Number (From Spec): _____

Coating System Title (From Spec): _____

Coating Supplier Name & Address: _____

_____

_____

Local Representative Name & Address: _____

_____

Manufacturer Representative Authorized to

Certify Proper Installation Name & Address: _____

_____

Surface Preparation: _____

Coating Material (Generic)	Product Number/ Name (Proprietary)	Coats/ Minimum Coverage	Color

Notes:

SECTION 11300

SUBMERSIBLE WASTEWATER PUMPS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish all labor, materials, equipment and incidentals required to install, complete, and ready for operation, submersible wastewater pumps as shown in the drawings and specified herein.

B. To assure unity of responsibility, the pumps, motors, control panel, integration and all appurtenances shall be furnished by the pump manufacturer and coordinated by the local pump manufacturer's representative. The Contractor and pump manufacturer shall assume responsibility for the satisfactory installation and operation of the entire pumping system.

C. These Specifications are intended to give a general description of what is required, but do not cover all details that will vary in accordance with the requirements of the equipment as offered. All materials, equipment, and appurtenances for the complete pumping units, whether specifically mentioned in these Specifications or not, shall be included.

D. The pump station is comprised of a concrete dry-well/wet-well configuration, three submersible wastewater pumps with new electrical, controls and all appurtenances as specified herein and shown on the drawings. The pump station will pump raw, unscreened, domestic wastewater.

E. It is expected that the equipment as offered incorporate the highest standards for this type of service.

1.02 RELATED SECTIONS

A. Concrete work and installation of anchor bolts is included in Division 3, but anchor bolts shall be furnished under this Section.

B. Piping and Valves are included in Division 15.

C. All Instrumentation and Controls are specified in the Control Panel drawings.

D. All Electrical improvements are specified in the Electrical drawings.

E. Other Sections as applicable.

1.03 REFERENCES

A. ANSI/Hydraulic Institute (HI) Standards;

1. ANSI/HI 11.6-2012. Rotodynamic Submersible Pumps: for Hydraulic Performance, Hydrostatic Pressure, Mechanical and Electrical Acceptance Tests

B. ANSI/HI 14.6-2011.Rotodynamic Pumps: for Hydraulic Performance Acceptance Tests

C. ANSI/National Electrical Manufacturers Association (NEMA) American National Standard Motors and Generators MG-1

D. International Organization for Standardization (ISO).

E. Applicable sections of the NEC, IEEE, ANSI and NEMA.

1.04 QUALIFICATIONS

A. The pumps covered by these Specifications are intended to be standard pumping equipment of proven ability as manufactured by a reputable manufacturer having a minimum of ten years' experience in the production of such pumps. The pumps furnished shall be new and unused and be designed, constructed, and installed in accordance with the best practice and methods of the industry. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards.

B. The pumps, motors, control system, and appurtenances shall be furnished by Fairbanks Morse/Pentair or Approved Equal.

1. In addition to these specifications, refer to the Drawings for additional requirement to be considered Approved Equal.

1.05 WARRANTY

A. The pump manufacturer shall provide a full, non-prorated, 5-year warranty covering all parts, service, and labor for 5 years from date of start-up and Owner acceptance.

B. The pump manufacturer shall provide a full, non-prorated, lifetime warranty covering the pump seals for all parts, service, and labor required to replace failed seals and all consequential pump damage.

1.06 SUBMITTALS

A. Copies of all materials required to establish compliance with the Specifications shall be submitted in accordance with the provisions of the General Conditions. Submittal shall include at least the following:

1. Shop and erection drawings showing all, important details of construction, dimensions, and anchor bolt locations.

2. Descriptive literature, bulletins, and catalogs of the equipment.

3. Data on the characteristics and performance of each pump. Data shall include a certified performance test, based on actual shop tests of the sale units, which show that they meet the specified requirements for head, capacity, efficiency, submergence, and horsepower. Curves shall be submitted on 8½ x 11 sheets, at as large a scale as is practical, including grid-lines. Curves shall be plotted from no flow at shut off head to the maximum flow at the minimum pressure recommended for the proposed pump. Curves also shall include NPSHR, Horsepower, and hydraulic efficiency. Catalog sheets showing a family of curves will not be acceptable. All tests shall be in accordance with ANSI/HI 11.6-2012.

4. Complete master wiring diagrams, elementary or control schematics, including coordination with other electrical control devices operating in conjunction with the pump control system and suitable outline drawings shall be furnished for approval before proceeding with manufacture. Standard pre-printed sheets or drawings simply marked to indicate applicability to this contract will not be acceptable.

5. A scale drawing showing the layout of the pump control panel shall be furnished. The layout shall indicate every device mounted on the door with complete identification.

6. The total weight of the equipment including the weight of the single largest item.

7. A complete, total Bill of Materials for all equipment.

8. A list of the manufacturer's recommended spare parts to be supplied in addition to those specified in paragraph 1.08, with the manufacturer's current price for each item. Include gaskets, seals, etc. on the list. List bearings by the bearing manufacturer's numbers only.

9. All submittal data required by the General Conditions.

10. Complete motor data.

B. In the event that it is impossible to conform to certain details of the Specifications due to different manufacturing techniques, describe completely all non-conforming aspects.

C. Upon receipt of approval of submitted material, provide the number of prints specified in the General Conditions. Provide electronic drawings in AutoCAD format upon request of engineer.

1.07 OPERATING AND MAINTENANCE MANUALS

A. Operating and maintenance manuals shall be furnished. The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment. The number and special requirements shall be as specified in the Contract Documents.

B. A factory representative who has complete knowledge of proper operation and maintenance shall be provided for one day, to instruct representatives of the Owner and the Engineer on proper operation and maintenance. If there are difficulties in operation of the equipment due to the manufacturer's equipment or fabrication, additional service shall be provided at no cost to the Owner.

1.08 TOOLS AND SPARE PARTS

A. 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.

B. The manufacturer shall furnish a complete set of recommended spare parts necessary for the first five years operation of the pumping system, which shall include at least the following for each pump supplied:

1. 1 set of upper bearings

2. 1 set of lower bearings

3. 1 set of upper and lower tandem shaft seals

4. 1 set of "O-Rings" or gaskets required for replacement of bearings and seals

5. 1 impeller wear ring or plate

6. 1 cable cap, if applicable

C. Spare parts shall be properly packaged and labeled for identification without opening the packaging and suitably protected for long term storage.

1.09 PRODUCT 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 and weather 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 surfaces of all exposed pump openings shall be protected by wood 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. After hydrostatic or other tests, all entrapped water shall be drained prior to shipment, and 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 content.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The pumping units required under this section shall be complete including pumps and motors with proper alignment and balancing of the individual units. All parts shall be so designed and proportioned as to have liberal strength, stability, and stiffness and to be especially adapted for the work to be done. Ample room shall be provided for inspection, repairs, and adjustments.

B. All necessary fasteners, chain, bolts, plates, nuts, and washers shall be AISI class 316 or greater Stainless Steel.

C. Stainless steel or brass nameplates giving the name of the manufacturer, the rated capacity, head, speed, and all other pertinent data shall be attached to each pump and motor. Nameplates shall include Underwriters Laboratories (UL) or Factory Mutual (FM) approval.

D. The nameplate ratings for the motors shall not be exceeded, nor the design service factor be reduced, when operating at any point on the characteristic curve.

2.02 PUMPS

A. Certification

The pump manufacturer must have a Quality Management System certified to ISO 9001.

B. General

1. Provide submersible non clog, closed coupled sewage pumps suitable for continuous duty submerged operation in liquids with a maximum temperature of 104°F without loss of watertight integrity.

2. The motor and pump shall be designed, manufactured, and assembled by the same manufacturer.

C. Pump and Motor shall conform to the following Specifications

Pump	
Pump Type	Submersible Solids Handling
Pump Mounting	Vertical-Closed Coupled
Number of Pumps	3
Pump Speed	1780 RPM
Pump Suction/ Discharge Size	8-inch/6-inch
Minimum Solids Passage	3 inch diameter

	Operating Points		
	Min	**Design**	**Max**
Flow, gpm	681	2073	2700
Pressure, ft H_2O	117	80	60

Motor	
HP	60
RPM	1780
Voltage	480V
Phase	3
Frequency	60 Hz

Refer to motor construction below.

D. Pump Construction

1. All major pump components shall be cast iron per ASTM A48 Grade 35. Castings shall have smooth surfaces devoid of blow holes and other casting irregularities. All fasteners shall be AISI class 316 stainless steel. All surfaces shall be primed with factory applied zinc phosphate primer and top-coated with either high solids two-part epoxy or polyester resin. The final top coat shall be 7 mils minimum thickness.

2. Impellers

   The impeller shall be of non-clog (capable of passing a 3 inch diameter sphere), single-suction, semi-open (single-shrouded), radial flow design, incorporating one or two long sweeping vanes with wide flow channel(s) and be constructed of cast iron per ASTM A48 Grade 35. Vortex-type design is not acceptable. Alternative impeller designs may be submitted for consideration given the following conditions:

   a. The proposed alternative impeller design has been in-use for this application and horsepower for a minimum of five years.

   b. The manufacturer can provide a minimum of five references of utility operators for interview by the Engineer.

   c. The manufacturer provides an additive or deductive alternate price for the acceptance of the alternate impeller. Such alternate price must not be included in the bid but offered to the Owner after award.

   The impeller shall be dynamic balancing and be capable of handling solids, fibrous materials, heavy sludge, and all other matter normally expected in raw domestic sewage. All fasteners shall be AISI class 316 stainless steel. The

pumps shall be furnished with a removable impeller wear ring or plate. The impeller shall be primed with factory applied zinc phosphate primer and top-coated with either high solids two-part epoxy or polyester resin.

3. Shaft Seals

Two separate mechanical shaft seals shall be provided and arranged in an upper and lower configuration. Seals shall be UL or FM approved for explosion proof motors and may be a Crane Type 21, Sealol Type 42, or a proprietary design. All seals must be silicon carbide. All metal components shall be AISI Class 316 stainless steel. All elastomers shall be Viton or Nitrile (Buna-N).

Seal systems shall be separated by an oil-filled reservoir. The reservoir shall have separate oil fill and drain plugs to insure accuracy when measuring lubricant level and for ease of maintenance. The outer seal shall be protected from exposure to solids and foreign matter.

Seal shall require no special maintenance or routine adjustment; however, shall be easily inspected or replaced. No seal damage shall result from operating the pump for short periods of time without liquid.

E. Electric Motor Construction

1. Design

a. All motors shall confirm to the latest HI, NEMA, IEEE, ANSI, and NEC standards and shall have UL and CSA approval on the name plate. The motor shall be continuous duty with the following characteristics:

1) Submersible motor integrity testing to 15 psi minimum for 5 min duration per HI 11.6.
2) Housing Materials: ASTM A-48, Grade 35 or greater
3) Motor Classification: NEMA Design B with torque and starting current in accordance with NEMA MG-1-12.2
4) Minimum efficiency – In accordance with NEMA MG-1 Table 51.
5) Service Factor: 1.15 minimum
6) Explosion class: NFPA 70 (NEC) Class 1 Division 1 Group C or D
7) Insulation Class: NEMA class F or H moisture resistant insulation
8) Starting frequency: Minimum of 10 starts per hour
9) Voltage tolerance: In accordance with NEMA MG-1-14.30

b. The motor shall be designed to continuously operate while in a non-submerged condition.

1) A cooling jacket is required.
2) The cooling jacket shall be a non-clogging design and shall not use product water.

c. The motor horsepower shall be adequate as to be non-overloading throughout the entire pump performance curve.

2. Rotor

Rotor shall be cast solid and dynamically balanced for vibration free operation. The pump and motor shaft shall be the same unit. The shaft shall be constructed from AISI class 420 or greater stainless steel. The shaft shall

be machined for positive placement of bearings. The upper and lower bearing shall be of heavy duty design, capable supporting the shaft and rotor while under maximum radial and thrust loads. The bearings shall be permanently grease lubricated and sealed at the time of installation.

3. Entry Cable Seals

All static seals at water tight mating surfaces shall be of Nitrile O-ring type. Use of auxiliary sealing compounds shall not be required. The power and control cables shall enter the motor through a terminal housing and comply with standard Factory Mutual (FM) design requirements. The entrance shall be sealed with a rubber grommet and clamp set which when compressed longitudinally causes a radial water tight seal. The clamp set shall prevent all slippage and rotation of cables while engaged, yet may be easily removed and reused during routine maintenance.

4. Cables

The pump and electrical cables shall be capable of continuous submergence without the loss of waterproof integrity and comply with standard Factory Mutual (FM) design requirements. Cables shall be of adequate length to accommodate installation for this project.

5. Water Tightness Integrity

Water-tight integrity of the motor housing and shaft seal shall be tested during manufacture by pressurizing the motor cavity and submerging in water with motor operating in accordance with ANSI/HI 11.6-2012.

6. Thermal Protection

The motor shall be protected from thermal and moisture damage. Thermal protection shall consist of three separate thermostatic switches embedded into the stator windings. Each switch shall open independently and terminate motor operation if temperature of the protected winding reaches the high temperature set point of 125 degrees F. The thermal sensing devices shall annunciate in the pump control panel per the control specifications.

7. Moisture Protection

Any moisture in the motor housing shall be detected by a mechanically activated moisture sensing micro-switch. The switch shall be sensitive enough to detect airborne moisture and terminate motor operation before liquid enters the cavity. Use of probes or floats that rely on the presence of liquids to initiate signal shall not be considered acceptable. The moisture sensing devices shall annunciate in the pump control panel per the control specifications.

2.03 ACCESS FRAMES AND GUIDES

A. The pumping station shall be furnished with the necessary aluminum access frames, complete with hinged and hasp-equipped covers, stainless steel upper guide holder, and level sensor cable holder. The frames shall be securely mounted above the pumps. Access doors shall have safety locking handle in the open position. Doors shall be of aluminum checkered plate with stainless steel hardware as manufactured by the Bilco Company, Babcock-Davis, Halliday, U.S. Fabrication or U.S. Foundry Co. No substitution is permitted.

2.04 PUMP CONTROL SYSTEM

Refer to paragraph 1.02C.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the locations shown on the drawings. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations. Anchor bolts shall be set in accordance with the manufacturer's recommendations.

B. The Contractor shall submit a certificate from the equipment manufacturer stating that the installation of the equipment is satisfactory, that the equipment is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit.

3.02 SHOP PAINTING

A. Before exposure to weather and prior to shop painting, all surfaces shall be thoroughly cleaned, dried, and free from all mill-scale, rust, grease, dirt, and other foreign matter.

B. All pumps and motors shall be shop coated. All surfaces shall be primed with factory applied zinc phosphate primer and top-coated with either high solids two-part epoxy or polyester resin. The final top coat shall be 8 mils minimum thickness. Alternative coating systems may be submitted for Engineers consideration.

C. All nameplates shall be properly protected during painting.

D. 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 Engineer up to the time of the final acceptance test.

3.03 INSPECTION AND TESTING

A. General Description

1. The Engineer shall have the right to inspect, test, or witness tests of all materials or equipment to be furnished under these specifications, prior to their shipment from the point of manufacture.

2. The Engineer shall be notified in writing prior to initial shipment, in ample time so that arrangements can be made for inspection by the Engineer.

3. The Engineer or his representative shall be furnished all facilities, including labor, and shall be allowed proper time inspection and testing of material and equipment.

4. Materials and equipment shall be tested or inspected as required by the Engineer, and the cost of such work shall be included in the cost of the equipment. The Contractor shall anticipate that delays may be caused because of the necessity of inspection, testing and accepting materials and equipment before their use is approved.

5. The services of a factory representative shall be furnished for one day, for each station, and shall have complete knowledge of proper operation and maintenance to inspect the final installation and supervise the test run of the equipment. With the permission of the Owner, these services may be combined with those provided under paragraph 1.07, OPERATING AND MAINTENANCE MANUALS.

6. Field tests shall not be conducted until such time that the entire installation is complete and ready for testing.

B. Pumps Inspection

1. After all pumps have been completely installed, and working under the direction of the manufacturer, conduct in the presence of the Engineer such tests as are necessary to indicate that pumps conform to the Specifications. Field tests shall include all pumps included under this Section. Supply all electrical power, water or wastewater, labor, equipment and incidentals required to complete the field tests.

2. If the pump performance does not meet the Specifications, corrective measures shall be taken or pumps shall be removed and replaced with pumps that satisfy the conditions specified. A 24-hour operating period of the pumps will be required before acceptance. During this 24-hour operating period, the Contractor shall supply all power necessary.

C. Motor Inspection

1. The Contractor shall check all motors for correct clearance and alignment and for correct lubrication in accordance with manufacturer's instructions. The Contractor shall check direction of rotation of all motors and reverse connections if necessary.

END OF SECTION

SECTION 15010

TESTING PIPING SYSTEMS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Perform specified services with Contractor's qualified personnel, or employ and pay for a qualified organization to perform specified services.

B. Pressure and Piping Systems.

1.02 RELATED REQUIREMENTS

A. Section 01041 - Project Coordination

B. Section 02610 - Pipe and Fittings

C. Section 15013 – Stainless Steel Pipe

D. Section 15060 – HDPE Pipe

E. Section 15064 – Ductile Iron Pipe and Fittings

F. Section 15064 – PVC Pipe and Fittings

1.03 DESCRIPTION

A. Perform testing of piping systems in accordance with the latest edition of AWWA and as specified below.

B. Provide instrument required for testing of piping systems.

1. Make instruments available to Engineer to facilitate spot checks during testing.

2. Retain possession of instruments; remove from site at completion of services.

C. Provide all water required for flushing and testing. The Contractor shall obtain a construction meter from the City at current rates and pay for meter rental and all water used.

D. Provide all necessary pumping equipment and other equipment, materials and facilities required for proper completion of the flushing and testing specified.

E. Source and quality of water, procedure and test equipment shall be acceptable to the Engineer. Length of tested line shall not exceed 2,000 feet.

F. All tests shall be made in the presence of the Engineer. Notify Engineer at least 48 hours before any Work is to be inspected or tested.

G. If inspection or test shows defects, the piping system(s) shall be repaired or replaced and inspection repeated, until such piping is acceptable to the Engineer.

H. All pipe, fittings, valves and joints shall be carefully examined during test. Leaky joints shall be tightened by remaking the joint.

I. Sections of the system may be tested separately. It shall be distinctly understood that any defect which may subsequently develop in section already tested and accepted shall promptly be corrected and that section retested.

J. Disposal of the water used for testing shall be subject to the approval of the Engineer.

1.04 QUALITY ASSURANCE

A. The organization which performs the testing shall, prior to testing, provide their qualifications and demonstrate their ability to perform the services to the satisfaction of the Engineer.

1.05 SUBMITTALS

A. Preliminary

1. Submit three copies of documentation to confirm compliance with Quality Assurance provisions:

a. Organization supervisor and personnel training and qualifications.

b. Specimen copy of each of the report forms proposed for use.

B. At least fifteen days prior to Contractor's request for final inspection, submit three copies of final reports on applicable reporting forms, for review.

1. Each individual final reporting form must bear the signature of the person who recorded data and that of the supervisor of the reporting organization.

2. Identify instruments of all types which were used and last date of calibration of each.

1.06 JOB CONDITIONS

A. Prior to start of testing of piping systems, verify that required "Job Conditions" are met:

1. System or system element installation is complete.

2. All required materials, water, instruments, etc. are on hand.

3. All other preparations are completed.

1.07 TESTING PROCEDURES

A. Gravity Sewer System:

1. Deflection Testing

a. PVC pipe shall be tested for excessive deflection by means of a "Go, No-Go" mandrel or sewer ball. A 7 1/2% Deflection Mandrel shall be pulled through each manhole section to determine if excessive deflection has taken place. If the mandrel fails to be pulled through the sewer pipe, the Contractor shall attempt to pull the mandrel through from the other end of the manhole section. If the mandrel fails to be pulled through, again, the Contractor shall repair or replace that portion of the sewer main which has exceeded the 7 1/2% allowable pipe deflection.

b. The Deflection Mandrel to be used for testing shall be submitted to the Engineer for approval prior to use. Each mandrel shall be constructed and utilized in accordance with the Uni-Bell Handbook of P.V.C. Pipe and the North American Pipe Corporation.

c. Deflection Testing shall not take place until thirty days following the final backfilling over the pipe. This will allow time for settlement of all the backfill material. The Engineers representative shall be present at all deflection tests.

d. As an alternative to Deflection Mandrel testing, deflection testing may be performed by lamping if approved by the Owner and Engineer. Sewer lamping shall be witnessed by the Engineer and a representative from the City.

2. Exfiltration and Infiltration Testing

a. Leakage tests by exfiltration and infiltration, as described below, will be made on all pipe. The Engineer shall have the option of determining which test(s) shall be employed. Generally, if the groundwater table is below the bottom of the pipe an exfiltration test shall be used. All other pipe shall be tested for infiltration.

b. Exfiltration Test

1) Exfiltration tests will be made on the pipe before or after backfilling at the discretion of the Engineer. The length of the sewer to be tested shall be such that the head over the crown of the upstream end is not less than 2 feet and the head over the downstream crown is not more than 6 feet unless directed otherwise by the Engineer. The sewer shall be plugged by pneumatic bags or mechanical plugs in such a manner that the air can be released from the sewer while it is being filled with water. The test shall be continued for one hour and provisions shall be made for measuring the amount of water required to maintain the water at a constant level during this period. If test results are unsatisfactory, the Engineer may direct that additional tests are made on any or all of the pipe.

2) If any joint shows an appreciable amount of leakage, the jointing material shall be removed and joint remade. If any pipe is defective, it shall be removed and replaced. No amount of leakage will be accepted. If the amount of leakage indicates defective joints or broken pipes, they shall be corrected by the Contractor.

c. Infiltration Test

1) Pipe shall be tested for infiltration after the backfill has been placed. Infiltration tests shall be made under the supervision of the Engineer, and the length of line to be tested shall be as directed by the Engineer. There shall be no allowable leakage.

2) Manhole exfiltration leakage shall not exceed 4 gallons per day per unit.

3) Sewer pipe exfiltration leakage shall not exceed 10 gallons per day per inch diameter per mile in a two-hour test period for any length of section tested.

4) Visible manhole or sewer pipe infiltration leakage shall not be acceptable.

5) Rates of infiltration shall be determined by means of a V-notch weir to be provided and installed by the Contractor in an approved manner, and at such times and locations as may be directed by the Engineer.

6) If an inspection of the completed sewer or any part thereof shows any manholes, pipes, or joints which allow the infiltration of water in a noticeable stream or jet, the defective work or material shall be replaced or repaired as directed.

7) All water used in testing and flushing shall be furnished at the Contractor's expense.

3. The sanitary sewer system shall be televised prior to final acceptance by the Engineer or the City. Video recording and reporting shall be reviewed. Contractor shall be responsible for correcting any deficiencies prior to acceptance by the City or submittal to any permitting agency. Testing and corrections shall be at the Contractor's expense.

B. Pressure Piping Systems

1. Water, sewer, and drainage pressure piping shall pass a hydrostatic pressure test and a leakage test as defined below before acceptance. The pressure and leakage test shall be made after all jointing operations are completed and after backfilling is completed. All concrete reaction blocks, or other bracing and restraining facilities, shall be in place at least 14 days before the initial filling of the line.

2. The pressure and leakage tests may be applied to an individual section of line isolated between the existing line valves, or may be applied to shorter sections of line at the Contractor's option. If shorter sections are tested, test plugs or bulkheads as required at the ends of the test section shall be furnished and installed by the Contractor at his expense, together with all anchors, braces, and other devices required to withstand the hydrostatic pressure on such plug or plugs, without imposing any hydraulic thrust on the pipe line or any part thereof. The Contractor shall be solely responsible for any and all damage to the pipe line, and/or to any other facility, which may result from the failure of test plugs furnished by him or supports therefore, in any case.

3. Hydrostatic Tests:

a. The section of line to be tested shall be slowly filled with water and all air expelled from the pipe. Care shall be taken that all air valves are installed and open in the section being filled, and that the rate of filling does not exceed the venting capacity of the air valves.

b. Hydrostatic test pressure shall be as follows:

System	Test Rating
Wastewater Force Main	150 psi
Potable Water	150 psi
Other Pressure Pipe	1.5 times maximum operation pressure.

c. After the pipe has been laid, all newly laid pipe of any valved section thereof shall be subjected to a hydrostatic pressure test.

d. Test pressure shall:

i. Not exceed pipe or thrust-restraint design pressures.
ii. Be of at least 2-hour duration.
iii. Not vary by more than ±5 psi (0.35 Bar) for the duration of the test.
iv. Not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants. NOTE: Valves shall not be operated in either direction at differential pressures exceeding the rated pressures.
v. Not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed valves.

2) Each valved section of pipe shall be filled with water slowly and the specified test pressure based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. The system shall be allowed to stabilize at the test pressure before conducting the leakage test.

e. Examination. Any exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test. Any damaged or defective pipe fittings, valves or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the Engineer.

1) Leakage Test

i. A leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or valved section thereof, to maintain pressure within 5 psi (0.35 Bar) of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. Leakage SHALL NOT BE MEASURED BY A DROP IN PRESSURE IN A TEST SECTION OVER A PERIOD OF TIME.
ii. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD * P^{1/2}}{148,000}$$

In which L is the allowable leakage, in gallons per hour; S is the length of pipe tested in feet; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test in pounds per square inch.

(b) To obtain leakage in liter/hour, multiply the values in the table by 3.785.
(c) When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/h/in (0.0012 L/h/mm) of nominal valve size shall be allowed.
(d) When hydrants are in the test section, the test shall be made against the closed hydrant.

(e) Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified in Section "b" above, Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.

(f) All visible leaks are to be repaired regardless of the amount of leakage.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Prior to testing, pig and flush all piping systems with water to remove all debris in the system. Pigging of lines 12" and smaller is not required unless the line becomes contaminated.

B. For testing refer to the Testing Procedures above.

C. No separate payment for testing shall be made.

END OF SECTION

SECTION 15062

DUCTILE IRON PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Ductile iron pipe and fittings piping shall be installed in those locations and depths as shown on the Drawings.

B. The equipment and materials specified herein is intended to be standard and ductile iron pipe and fittings used in transporting water and wastewater.

1.02 RELATED SECTIONS

A. Section 01340 – Shop Drawings, Working Drawings and Samples

B. Section 01670 – Testing Piping Systems

C. Section 15100: Valves and Appurtenances

D. Other Sections as Applicable.

1.03 REFERENCES

A. ASTM A307 Grade B: Low-Carbon Steel Bolts for Flanged Pipe.

B. ANSI/AWWA C104/A21.4: American National Standard for Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water.

C. ANSI/AWWA C105/A21.5: American National Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.

D. ANSI/AWWA C110/A21.10: American National Standard for ductile iron and gray iron fittings 3 inch through 48 inch for Water and Other Liquids.

E. ANSI/AWWA C110/A21.10: American National Standard for ductile iron and gray iron fittings 3 inch through 48 inch for Water and Other Liquids.

F. ANSI/AWWA C150/A21.50: American National Standard for Thickness Design of Ductile Iron Pipe.

G. ANSI/AWWA C151/A21.51: American National Standard for Ductile Iron Pipe, Centrifugally Cast.

H. ANSI/AWWA C153/A21.53: American National Standard for ductile iron compact and gray iron fittings 3 inch through 16 inch for Water and Other Liquids.

I. ANSI/AWWA C600: American Water Works Association Standard for Installation of Ductile Iron Water Mains and Their Appurtenances.

J. ASME/ANSI B16.1: Cast Iron Pipe Flanges and Flanged Fittings, Class 125.

K. ASME/ANSI B16.5: Pipe Flanges and Flanged Fittings, Class 150 (Flat Face Flange).

L. ASME/ANSI B16.42: Ductile Iron Pipe flanges and Flanged Fittings, Class 150 (Flat Face Flange).

M. Ductile Iron Pipe Research Association: Thrust Restraint Design for Ductile Iron Pipe.

1.04 SUBMITTALS

A. Submit a list of materials to be furnished, with the names of the suppliers and the date of delivery.

B. Submit sworn certificates of foundry material and strength tests, and their results. In addition, all ductile iron pipe and fittings may be inspected at the foundry for compliance with the Specifications by an independent testing laboratory selected by the Owners. The manufacturer's cooperation shall be required in these inspections. The cost of foundry inspections requested by the Owner will be borne by the Contractor.

C. Waiving of the inspection privileges shall not relieve the Contractor or manufacturer of the responsibility of furnishing pipe and fittings meeting the Specification.

D. Shop Drawings shall be submitted in accordance with Section 01340 and shall include dimensioning, methods and location of supports and all other pertinent technical specifications for all pipe and fittings to be furnished. Shop drawings shall be prepared by the pipe and fittings manufacturer.

E. Manufacturer shall furnish a laying schedule providing a location, type and size of all pipe joints.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Ductile iron pipe and fittings shall be furnished by manufacturers who are fully experienced, reputable, and qualified in the manufacture of the materials. The pipe and fittings shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with the Specifications in all respects. Acceptable manufacturers include:

1. American Cast Iron Pipe Company
2. Atlantic States Cast Iron Pipe Company
3. Clow Water Systems Company
4. Griffin Pipe Products Company
5. McWane Cast Iron Pipe Company
6. Pacific States Cast Iron Pipe Company
7. United States Pipe and Foundry Company

2.02 COMPRESSION JOINT PIPE AND FITTINGS

A. Pipe shall conform to ANSI/AWWA C151/A21.51 and C150/A21.50.

B. Fittings shall conform to ANSI/AWWA C110/A21.10 & C153/A21.53.

C. Rubber gaskets shall conform to ANSI/AWWA C111/A21.11.

D. Thickness shall be minimum pressure Class 350 through 12" and pressure Class 300 in sizes 14" and larger.

E. Install compression joint pipe below ground. Provide sufficient quantities of lubricant and gaskets.

2.03 MECHANICAL JOINT PIPE AND FITTINGS

A. Pipe shall conform to ANSI/AWWA A21.50/C151 and C150/A21.50.

B. Fittings shall conform to ANSI/AWWA C110/A21.10 & C153/A21.53.

C. Thickness shall be minimum pressure Class 350 through 12" and pressure Class 300 in sizes 14" and larger.

D. Rubber gaskets shall conform to ANSI/AWWA C111/A21.11.

E. Bolts for mechanical joint pipe shall be tee-head design. Nuts and bolts shall be high-strength low alloy steel.

F. Mechanical joint pipe shall be installed below ground.

G. Furnish with sufficient supply of accessories, i.e., gaskets, bolts, and glands, as required for each joint.

2.04 FLANGED JOINT PIPE AND FITTINGS

A. Pipe and fittings shall conform to ANSI/AWWA C115/A21.15.

B. Thickness shall be minimum pressure Class 350 through 12" and pressure Class 300 in sizes 14" and larger.

C. Flanges and flanged fittings shall be flat face conforming to ANSI/AWWA C110/A21.10. Full face 1/8 inch thick rubber ring gaskets shall conform to ANSI/AWWA C110/A21.10.

D. Flanges shall be ductile iron. Cast iron flanges will not be allowed.

E. Flanged ductile iron pipe shall have factory applied screwed long hub flanges. Flanges shall be faced and drilled after being screwed on the pipe, with flanges true to 90 degrees with the pipe axis and shall be flush with end of pipe conforming to ANSI B16.1 Class 125.

F. Bolts for flange pipe shall be low-carbon steel conforming to ASTM A307 Grade B.

G. Flanged joints shall be used for above ground piping and exposed piping in vaults and in indoor pipe galleries.

2.05 GROOVED END PIPE AND FITTINGS

A. Grooved end pipe and fittings shall be acceptable for above-ground installation.

B. Pipe shall conform to ANSI/AWWA C606.

C. Grooved end pipe shall be minimum thickness to conform to former Class 53.

D. Grooved end joints shall be flexible type, radius cut grooved, conforming to AWWA C606.

E. Grooved end fittings shall be ANSI B16.1, radius cut grooved, rigid joint, as manufactured by Victaulic Company, Gustin-Bacon, or approved equal.

F. Grooved end pipe adapter flanges shall be ductile iron, ASTM A536, Victaulic, Gustin-Bacon, or approved equal.

G. Bolts shall be manufactured standard.

H. Gaskets for grooved end joints shall be manufacturer's flush-seal type specifically designed for cast surfaces. Properties shall be as designated in ASTM D 2000. Dimensions shall conform to AWWA C606. Lubricant shall be manufacturer's standard.

I. Install in accordance with manufacturer's printed instructions. Dress cut ends of pipe for couplings and adapters as recommended.

2.06 LININGS AND COATINGS

A. Pipe and fittings for wastewater service shall be double thickness cement mortar lining in accordance with ANSI/AWWA C104/A21.4. Cement lining shall be Type 2 Portland Cement, a sulfate resistant cement.

B. An interior bituminous coating shall not be required; however, coated pipe will not be rejected. The Owner will not, however, pay for the additional interior coating costs.

C. Below ground pipe and fittings shall receive a manufacturer's standard bituminous coating per AWWA C151 for ductile iron pipe, AWWA C115 for flange pipe and AWWA C110 for fittings.

D. Pipe and fittings exposed to view in the finished work shall not receive the standard bituminous or asphalt coat on the outside surfaces, but shall be shop primed on the outside with one coat of a rust inhibitive primer. Should portions of the pipe inadvertently be given the outside coating of coal tar enamel instead of the rust inhibitive primer as required for exposed piping, the surfaces shall be sealed with a non-bleeding sealer coat. Sealer shall be a part of the work of this Section.

E. Pipe and fitting installations in corrosive earth between the limits shown on the drawings or as required by the Engineer shall be fully encased in an 8 mil polyethylene sleeve in accordance with ANSI A21.5 Method "A".

2.07 SPECIAL PIPE AND FITTING

A. Long span flange pipe shall be minimum pressure Class 350. Gaskets shall be Toruseal type with O-ring or equal.

B. Wall castings shall be of the size and types shown on the Drawings and bituminous coated.

C. Flexible joint (ball joint or river crossing) type pipe shall comply with ANSI/AWWA C151/A21.51 and ANSI/AWWA C110/A21.10. Pipe shall provide a variable deflection of up to 15 degrees. The spherical threaded socket shall be manufactured in conformance with AWWA C110 and ANSI B2.1.

2.08 RESTRAINED JOINTS

A. The location and number of restrained joints are shown on the drawings and details.

B. Joints shall be the standard design of the pipe and fitting manufacturer and shall provide a 2:1 safety factor.

C. Restrained joints shall be designed for a pressure class rating of 350 psi in sizes 4 inch through 12 inch and 300 psi for 14 inch through 64 inch unless shown otherwise on the drawings.

D. Bolts and nuts for restrained joints shall be low alloy, high strength steel.

E. Restrained joints are to meet the applicable requirements of ANSI/AWWA C110/A21.10 and shall be manufacturer’s standard, Mega lug by EBAA Iron Inc. or approved equal.

PART 3 - EXECUTION

3.01 HANDLING PIPE AND FITTINGS

A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe or fittings shall not be dropped. All pipe or fittings shall be

examined before laying. No piece shall be installed which is found to be defective. Any damage to the pipe coatings shall be required as directed by the Engineer.

B. All pipe and fittings shall be subjected to a careful inspection prior to being laid or installed.

C. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional expense to the Owner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work, and when installed or until they are used in the work, and when installed or laid, shall conform to the lines and grades required.

3.02 LAYING PIPE AND FITTINGS

A. Ductile iron pipe and fittings shall be installed in accordance with requirements of ANSI/AWWA C600 except as otherwise provided herein.

B. All pipe shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plugs or other approved means.

C. Suitable excavations shall be made in the trench bottom to receive pipe with raised bells.

D. As soon as the excavation is completed to the normal grade of the bottom of the trench, immediately place screen gravel or crushed stone (where applicable) bedding in the trench, and then the pipe shall be firmly bedded in this material to conform accurately to the line and grade indicated on the Drawings. Blocking under the pipe will not be permitted. Bedding shall conform with Type 2 condition unless otherwise specified.

E. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a "Tyton" type bell shall be beveled to conform to the manufactured spigot end. The lining shall remain undamaged.

3.03 JOINTS

A. Push-on joints shall be made in strict accordance with the manufacturer's instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe, and the joint surfaces cleaned and lubricated. The plain end of the pipe is to be aligned with the bell of the pipe to which it is to be joined, and pushed home with a jack or by other means. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.

B. Mechanical joints at valves, fittings, and where designated on the Drawings and as specified, shall be in accordance with the "Notes on Method of Installation" under ANSI A21.11 and the instructions of the manufacturer. To assemble the joints in the field, thoroughly clean the joint surfaces and rubber gasket with soapy water before tightening bolts. Bolts shall be tight to the specified torques. Under no condition shall extension wrenches, pipe over handle or ordinary ratchet wrenches be used to secure greater leverage.

C. Ball joints, where designated on the drawings and as specified, shall be installed in strict accordance with the manufacturer's instructions. Where ball joint assemblies occur at the face of structures or tanks, the socket end shall be at the structure or tank and the ball end assembled to the socket.

D. Flanged joints shall be in accordance with ANSI A21.15 including its Appendix "A" and the instructions of the manufacturer. Flanged joints shall be fitted so that the contact faces bear uniformly on the gasket and then are made up with relatively uniform bolt stress.

E. All valves, hydrants, fittings and other appurtenances needed upon the pipe lines shall be set and jointed as indicated on the Drawings or as required by the manufacturer.

F. Unless otherwise noted, underground piping shall be push-on joint or mechanical joint with restraints as needed and above ground or exposed piping shall be flanged.

G. Deflected bell pipe shown on the Drawings is shown only to assistance in illustrating a preferred means of installation in specific locations, and is not intended to indicate all deflected bell pipe necessary to effect the installation as shown in plan and profile views. The cost of all such deflections shall be included within the bid price for furnishing and installing the pipe.

H. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, or where long radius curves are permitted, the amount of deflection shall not exceed 50% of the maximum deflection allowed by manufacturer.

3.04 RESTRAINED JOINTS

A. Section of piping designated on the Drawings as having restrained joints or those requiring restrained joints shall be constructed using mechanical or compression joint pipe and fittings with restraining devices.

B. Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of cut out that corresponds with the minimum specified wall thickness for the rest of the pipe.

C. 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. This shall be determined in accordance with the requirements of the Ductile Iron Pipe Research Association: Thrust Restraint Design for Ductile Iron Pipe.

3.05 PIPE THRUST BLOCKS

A. Concrete thrust blocks are not an acceptable alternative to restrained joints. Concrete thrust blocks may only be used on a case-by-case basis as approved by the Engineer.

3.06 CLEANING AND FLUSHING

A. The pipe shall be thoroughly cleaned of all foreign matter before installation. It is the Contractor's responsibility to insure cleanliness of the pipe during installation and backfilling. At the conclusion of the work, the Contractor shall thoroughly clean the entire pipe by flushing with water or other materials which may have entered during the construction period. Debris cleaned from the lines shall be removed from the lowest outlet. If, after this cleaning, obstructions remain, they shall be removed. After the pipe is cleaned, the Engineer will examine the pipe for leaks. If defective pipes or joints are discovered at this time, they shall be repaired by the Contractor.

B. The method required for use is the passage of a sufficient number of "pigs" through the pipeline to effect the cleaning of the system.

C. Passage of the cleaning "pigs" through the system shall be constantly monitored, controlled. Pigs entered into the system shall be individually parked and identified so that their exiting from the system can be confirmed.

D. The Contractor must demonstrate to the satisfaction of the proper authority(s) that this work will be performed by experienced and knowledgeable supervision and personnel who have properly, safely and effectively provided for the cleaning of comparable systems in other applications. These personnel will be required to provide acceptable procedures prior to the work being initiated, that will clearly illustrate they are capable and have the means on hand to resolve potential or real problems that may occur with the cleaning pigs in the system. The Contractor shall provide evidence of qualification by providing copies of his/her state certification or license to perform such work as herein describe. Such documentation shall be included as part of the submittal process.

E. Report Completion: The Contractor shall provide a written report upon completion of line cleaning to outline and detail information acquired during the cleaning process about the system or to confirm existing information.

F. Cost of pigging the pipelines shall be included in the unit price for furnishing and installing the pipe and fittings. No additional cost for pigging will be allowed.

3.07 PRESSURE & LEAKAGE TESTS

A. Hydrostatic pressure and leakage test shall conform to AWWA C600, with the exception that the Contractor shall furnish all gauges, meters, pressure pumps and other equipment needed to test the line.

B. The pressure required for the field hydrostatic pressure test shall be minimum 150 psi. The Contractor shall provide temporary plugs and blocking necessary to maintain the required test pressure. Corporation cocks at least 3/4 inches in diameter, pipe riser and angle globe valves shall be provided at each pipe dead-end in order to bleed air from the line. Duration of pressure test shall be at least two (2) hours. The cost of these items shall be included as a part of testing and is included in the cost to furnish and install pipe and fittings.

C. The leakage test shall be a concurrent test, at the maximum operating pressure as determined by the Engineer, with the pressure test and shall be not less than two hours in duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are compiled with. Defective materials, pipes, valves and accessories shall be removed and replaced. The pipe lines shall be tested in such sections as may be directed by the Engineer by shutting valves or installing temporary plugs as required. The pipe shall be filled with water, all air removed and the test pressure maintained in the pipe for the entire test period by means of a force pump to be furnished by the Contractor. Accurate means shall be provided for measuring the water required at this pressure. The amount of water required is a measure of the leakage.

D. The amount of leakage which will be permitted shall be in accordance with AWWA C600 for all pressure lines.

E. The Contractor must submit his plan for testing to the Engineer for review at least ten (10) days before starting the test. The Contractor shall remove and adequately dispose of all blocking material and equipment after completion and acceptance of the field hydrostatic test, unless otherwise directed by the Engineer. Any damage to the pipe coating shall be repaired by the Contractor. Lines shall be totally free and clean prior to final acceptance.

3.08 DISINFECTING

A. Before being placed in service, all potable water pipelines shall be chlorinated in accordance with AWWA C651, "Standard Procedure for Disinfecting Water Mains." The procedure shall be approved by the Engineer. The location of the chlorination and sampling points will be determined by the Engineer in the field. Taps for chlorination and sampling shall be uncovered and backfilled by the Contractor as required.

B. The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines, and then introduce chlorine in approved dosages through a tap at one end, while water is being withdrawn at the other end of the line. The chlorine solution shall remain in the pipeline for at least 24 hours.

C. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system. Bacteriological sampling and analysis of the replacement water shall then be made by the Engineer in full accordance with AWWA C651. The Contractor will be required to re-chlorinate, if necessary. The line shall not be placed in service until the requirements of the State and County Public Health Department are met.

D. Special disinfecting procedures shall be used in connections to existing mains, and where the method outlined above is not practical.

E. The Contractor shall make all arrangements necessary with the County Health Department for the collection and examination of samples of water from disinfected water mains. These samples shall be examined for compliance with Department of Health and Rehabilitative Services requirements. Sampling shall be made daily and continuously until two successive examinations are found satisfactory. If unsatisfactory, the line shall be flushed and disinfected again. The cost of sampling, flushing and disinfecting shall be included in the contract price and no additional charge shall be made to the Owner for this work.

END OF SECTION

SECTION 15064

GENERAL PURPOSE POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals required to install PVC pipe made in schedule 40 or 80 sizes and pressure rated for water, fittings and appurtenances as specified herein.

1.02 RELATED WORK

A. Section 15100: Valves and Appurtenances

1.03 DESCRIPTION OF SYSTEM

A. Plastic piping shall be installed in the locations as indicated in the Drawings.

1.04 QUALIFICATIONS

A. Plastic pipe, fittings, and appurtenances shall be furnished by a single manufacturer who is fully experienced, reputable, and qualified in the manufacture of the items to be furnished. The equipment shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these Specifications.

1.05 SUBMITTALS

A. Submit shop drawings in accordance with the General Conditions and Section 01340. Provide dimensioning and technical specifications for piping to be furnished.

B. Submit samples of all materials specified herein.

C. Submit a pipe layout schedule listing pipe size and Class, use, and location.

1.06 TOOLS

A. Special tools, solvents, lubricants, and caulking compounds required for normal installation shall be furnished with the pipe.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic pipe shall be rigid, unplasticized, polyvinyl chloride (PVC) pipe and shall be in accordance with ASTM D1784 and ASTM D1785, ASTM 1120 or in conformance with AWWA C-900, Class 150 psi, and as manufactured by Celanese Piping Systems, Chemtrol Division,. Cabot Company., or approved equal.

B. The pipe shall be suitable for field cutting, welding, bending, and coupling; shall be Schedule 80 unless otherwise shown on the Drawings; and shall be of the sizes shown on the Drawings. Pipe supports shall be as specified in Section 15094.

C. All pipe shall be bundled or packaged in such a manner as to provide adequate protection for the ends, whether threaded or flanged, during transportation from the manufacturer.

D. Fittings shall be the socket type for solvent welded joints as designated in ASTM D2467 or D2466, except where threaded as shown on the Drawings, and as designated in ASTM D2464 or flanged as shown on the Drawings and shall be

compatible with the pipe where installed. Flanges shall be furnished with 1/8 inch thick full-faced gaskets. Flange bolts and nuts shall be ASTM A276, Type 304 or 316 stainless steel.

E. Plastic tubing shall be clear, flexible, and non-cracking, with a wall thickness that is adequate for the pressures involved and shall be of the sizes as shown on the Drawings.

F. Caulking for plastic pipes in wall sleeves shall be by a mechanical, modular, rubber sealing element placed in between the sleeve and the pipe and expanded to make a tight fit or shall be by another method approved by the Engineer.

G. Expansion joints shall have integral duck and rubber flanges. They shall have individual solid steel ring reinforcement with a carcass of highest grade woven cotton or acceptable synthetic fiber. Joints shall be constructed of pipeline size and shall meet working pressure and corrosive conditions similar to the line where installed. They shall be of a filled arch type construction with a minimum of three arches per joint. All joints must be finish-coated with Hypalon paint to prevent ozone attack. They shall be Style 500 as manufactured by Mercer Rubber Co. of Trenton, New Jersey, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The installation of plastic pipe shall be done in strict accordance with the manufacturer's technical data and printed instructions.

B. Joints for plastic pipe shall be solvent welded, except flanged or threaded where required. In making solvent welded connections, clean dirt and moisture from pipe and fittings, bevel pipe ends slightly with emery cloth, and apply solvent cement. Expansion joints shall be installed every 50 feet on long runs and in every straight run longer than 15 feet.

C. Installation of valves and fittings shall be in strict accordance with manufacturer's instructions. Particular care shall be taken not to overstress threaded connections at sleeves. In making solvent welded connections care shall be taken to ensure that no solvent is spilled on valves or allowed to run from joints.

D. All piping shall have a sufficient number of unions to allow convenient removal of piping and shall be as approved by the Engineer.

E. Where plastic pipe passes through wall sleeves, joints shall be sealed with a mechanical sealing element as specified in Section 15100.

F. All plastic pipe-to-metal pipe connections shall be made using flanged connections. Metal piping shall not be threaded into plastic fittings, valves, or couplings, nor shall plastic piping be threaded into metal valves, fittings or couplings.

G. Concrete inserts for hangers and supports shall be furnished and installed in the concrete as it is placed. The inserts shall be set in accordance with the requirements of the piping layout and the Contractor shall verify their locations from approved piping layout drawings and the structural drawings. Pipe hangers and supports are specified in Section 15094.

3.02 FIELD PAINTING

A. Pipe normally exposed to view shall be painted and marked as specified in the Painting Section 09900. Identify pipe contents, direction of flow, use proper color (per OSHA) and identification of pipe.

3.03 TESTING

A. Pipelines shall remain undisturbed for 24 hours to develop complete strength at all joints. Pipelines shall be subjected to a minimum 150 psi hydrostatic pressure test for 2 hours. All leaks shall be repaired and lines retested as approved by the Engineer. Prior to testing, the pipelines shall be supported in an approved manner to prevent movement during tests.

END OF SECTION