



**TECHNICAL REVIEW COMMITTEE MEETING
CITY OF ST. PETE BEACH
COMMISSION CHAMBERS**

**Notice of Public Meeting
Technical Review Committee**

Community Development Department TRC Room
155 Corey Avenue, City Hall, St. Pete Beach, FL 33706

Wednesday, August 5, 2026
10:00 AM

Regular Meeting Agenda

This is an informal meeting between City staff and the applicant(s). The public is invited to attend, however no public comment shall be permitted.

Discussion Items

1. 620 Corey Avenue: Change of use request

The applicant is requesting to convert the existing residence to a limited-service or takeout-only restaurant and utilize the outdoor space for seating. This request is for permanent conversion following abandonment of temporary use permit 26062, which proposed use of the property as an outdoor activity or event space.

2. Conditional Use Permit 26117: 20th Ave Street-end (Lift Station #4)

The City of St. Pete Beach requests a conditional use permit for public facility improvements at the street-end of 20th Avenue east of Pass A Grille Way, including installation of an elevated generator and platform, exchange of electrical control panels, and installation of screening fencing with curb improvements. Adjacent zoning of CG-1.

Next Meeting: August 19, 2026

**TECHNICAL REVIEW COMMITTEE MEETING
CITY OF ST. PETE BEACH
COMMISSION CHAMBERS**

Agenda Report

Agenda Title Name: 620 Corey Avenue: Change of use request

Action Request:

Strategic Objective:

Date: August 5, 2026

Prepared By: Brandon Berry, Senior Planner

Through: Laura Canary, Community Development Director

Summary of Issue: The applicant is requesting to convert the existing residence to a limited-service or takeout-only restaurant and utilize the outdoor space for seating. This request is for permanent conversion following abandonment of temporary use permit 26062, which proposed use of the property as an outdoor activity or event space.

Funding:

Attachments:

1. Change of Use Narrative-6_2026
2. Site Plan 6_26
3. Site Changes 6_26

CITY OF ST. PETE BEACH - TECHNICAL REVIEW COMMITTEE

Change of Use

620 Corey Avenue

Proposed Neighborhood Café & Market Establishment

Property Owner: Jason Bartell

Project Summary

The purpose of this application is to request a change of use for the existing property located at 620 Corey Avenue from its current mixed-use status to a limited-service commercial establishment.

The proposal is intended to provide a neighborhood-scale takeout food service and retail use that complements the City's vision for the Corey Avenue district while minimizing impacts to surrounding properties through adaptive reuse of the existing structure.

Rather than constructing a new building or significantly increasing the building footprint, the proposal focuses on repurposing the existing residence into a small-scale commercial use with limited indoor seating, take-out service using a ventless kitchen system, and accessory retail sales.

Proposed Use

The proposed business will operate as a limited-service establishment where patrons may order food from a service window or counter for take-out service.

A limited amount of indoor seating will be provided within the existing living room area, with several additional picnic tables located outdoors for customers who choose to dine on-site.

The intent is to provide a casual, neighborhood-oriented dining experience rather than a traditional full-service restaurant.

Building Conversion

The existing residential structure will remain substantially intact and will be adaptively reused as follows:

- Existing Living Room converted to approximately 121 square feet of customer dining area
- One existing bedroom converted into a service kitchen
- Existing kitchen retained as the primary food preparation area-approximately 121 square feet
- One existing bedroom converted into an administrative office
- Existing residential bathroom retained for employee use only

Because only a limited portion of the existing structure will be utilized for customer seating and food service, the commercial intensity of the site remains intentionally modest.

Ventless Commercial Kitchen Concept

To further minimize the intensity of the proposed use and reduce impacts typically associated with a traditional restaurant, the applicant intends to utilize a ventless commercial kitchen system as part of the food preparation area.

Unlike a conventional commercial kitchen that requires a Type I exhaust hood, grease duct, and rooftop exhaust system for grease-producing appliances, a ventless kitchen utilizes UL-listed commercial cooking equipment with built-in filtration and fire suppression technology, where permitted by applicable building and fire codes. The use of ventless equipment offers several benefits for this project, including:

- Eliminates the need for rooftop exhaust hoods and grease ducts (where approved by code).
- Reduces exterior impacts to neighboring properties by minimizing noise, odors, and visual equipment.
- Preserves the appearance of the existing residential structure through adaptive reuse.
- Reduces infrastructure modifications required for the building.
- Supports a cleaner, quieter, and lower-intensity commercial operation.

The proposed kitchen is intended to prepare a variety of fresh menu items while maintaining the limited-service nature of the establishment. Depending on the final equipment selection and all applicable approvals, the menu may include items such as:

- | | |
|---|----------------------------------|
| • Sandwiches and wraps | • Breakfast sandwiches |
| • Flatbreads and pizzas | • Soups and chili |
| • Gourmet hot dogs and sausages | • Salads and grain bowls |
| • Paninis and pressed sandwiches | • Soft pretzels |
| • Burgers prepared with approved ventless equipment | • Coffee and espresso beverages |
| • Chicken sandwiches and tenders | • Smoothies and specialty drinks |
| | • Desserts and baked goods |

The applicant understands that all cooking equipment will be subject to review and approval by the Building Official, Fire Marshal, and any other applicable regulatory agencies. Any equipment installed will comply with the applicable provisions of the Florida Building Code, Florida Fire Prevention Code, and all manufacturer installation requirements.

The intent of incorporating a ventless commercial kitchen is to provide a quality food service operation while maintaining a scale and operational intensity that is appropriate for the site and consistent with the City's vision for a walkable, neighborhood-oriented commercial district.

Outdoor Improvements

Outdoor improvements are designed to enhance the customer experience while maintaining compatibility with neighboring properties. These improvements include:

- Removal of specified concrete areas to comply with ISR, and replaced with shell
- Outdoor picnic tables for limited outdoor seating
- One television facing Corey Avenue
- Two televisions located toward the rear of the property
- Landscaping enhancements to act as barrier for neighboring properties

- Bicycle parking
- ADA restroom
- Designated customer gathering areas
- No outdoor entertainment stage or amplified live music is proposed as part of this application.

Accessory Storage Structure

- The existing detached shed located at the rear of the property will initially serve as storage and food preparation support.
- Upon obtaining all required state and local approvals, including applicable beverage licensing, the applicant intends to utilize the structure for limited beer and wine service as an accessory use to the primary establishment.
- No structural expansion of the shed is proposed.

Accessibility

- The existing entrance stairs on the west side of building will be replaced with ADA-accessible entrance ramp for providing accessible entry into the primary building.
- An additional ADA-compliant customer restroom will be constructed at the rear of the building and connected to the existing plumbing system to provide accessible facilities for patrons, with no service needed regularly.

Parking

- The proposed customer dining area consists of approximately 121 square feet, with an additional 121 square feet dedicated to the service kitchen, representing a relatively small percentage of the overall building area devoted to customer occupancy. The applicant respectfully requests that the City evaluate the proposed parking requirements in light of the limited-service nature of the establishment, the modest customer seating area, and the availability of nearby leased off-site parking.
- If needed, an agreement has been established with the owner of Central Dental St. Pete Beach to lease approximately 28 off-site parking spaces located approximately 528 feet from the subject property. These spaces will be available after normal business hours during weekdays and throughout the day on weekends.
- The parties are currently preparing a proposed long-term lease agreement, and documentation can be provided to the City upon request.

Drainage and Site Improvements

- As part of the redevelopment, portions of the existing concrete surface will be removed to improve compliance with the City's impervious surface ratio requirements and to enhance stormwater drainage.
- Additional landscaping, including shrubs and trees along the west property line, will be installed to provide buffering for adjacent residential properties while improving the appearance of the site.

Sanitation

- All refuse generated by the business will be managed using the City's designated commercial garbage containers in accordance with City sanitation requirements.
- The property will be maintained in a clean, orderly, and professionally managed condition.

Community Benefit

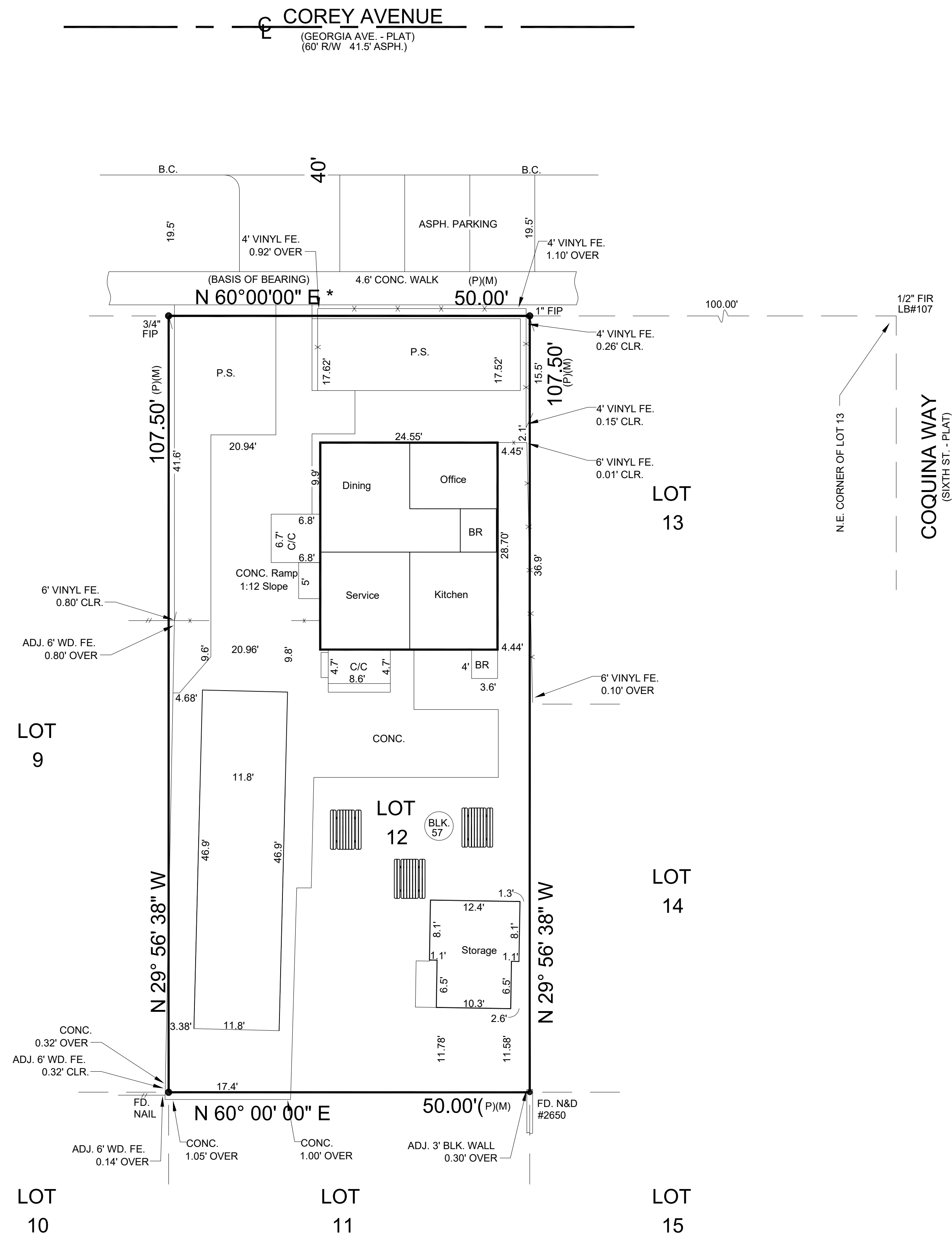
The proposed project represents a significant private investment in an existing property through adaptive reuse rather than redevelopment. The intent is to create a neighborhood-scale business that:

- Supports the City's vision for the Corey Avenue commercial district.
- Provides additional food service opportunities for residents and visitors.
- Encourages walkability and bicycle access.
- Activates an underutilized property while preserving the existing building.
- Improves site drainage and landscaping.
- Minimizes impacts to neighboring properties through buffering, limited seating, and modest operational intensity.
- This proposal is intentionally designed as a low-impact commercial use that fits within the surrounding neighborhood while contributing to the continued revitalization of Corey Avenue.

Conclusion

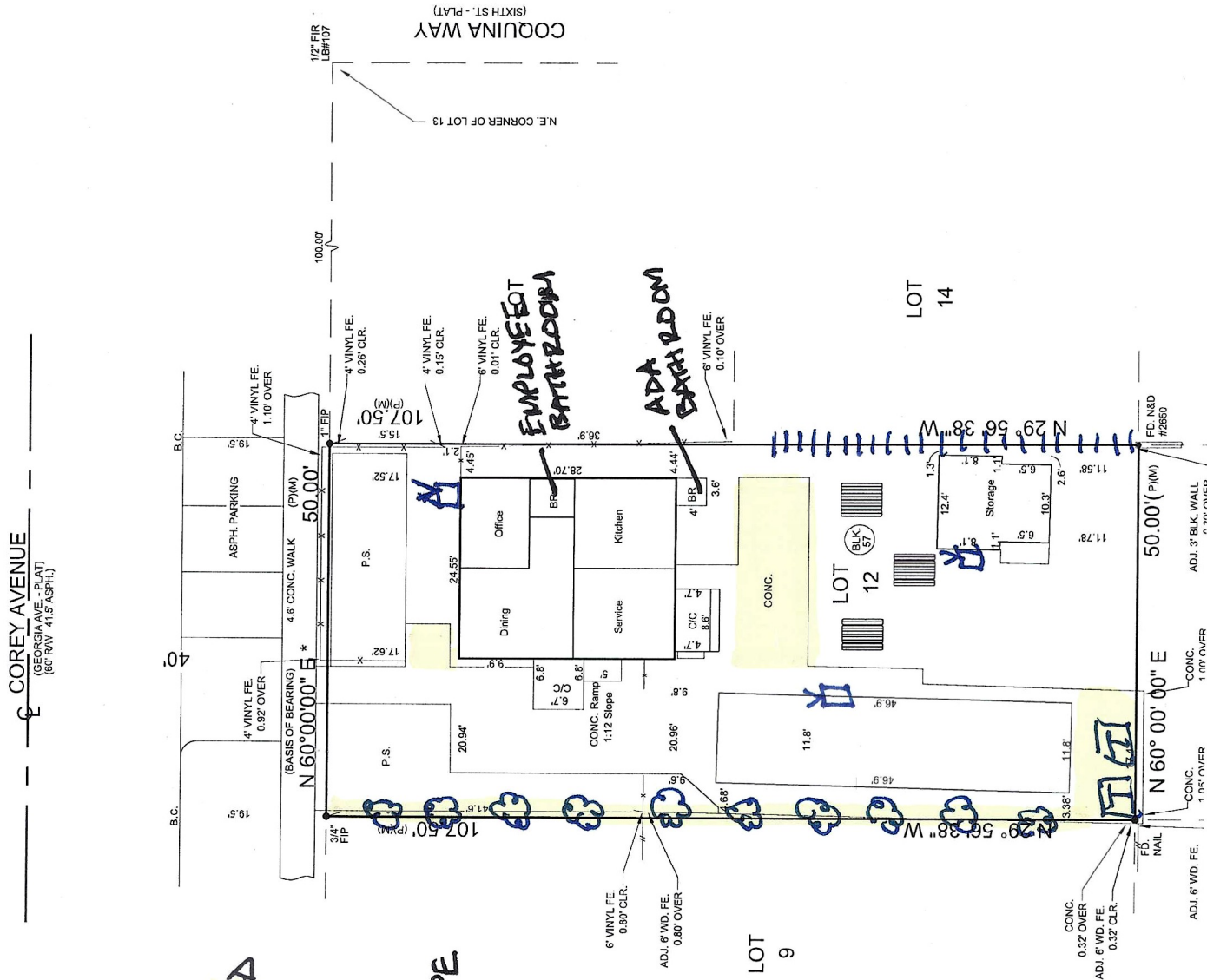
- The applicant respectfully requests the Technical Review Committee's consideration of this proposed change of use from mixed-use to a limited-service commercial establishment.
- By adaptively reusing the existing structure, improving drainage and landscaping, providing off-site parking, and limiting the intensity of operations, the proposal seeks to balance economic development with compatibility for surrounding properties.
- The applicant welcomes the Committee's comments and looks forward to working collaboratively with City staff throughout the review process to ensure the project meets all applicable development standards and contributes positively to the future of the Corey Avenue district.

NORTH (ASSUMED)



A BOUNDARY SURVEY OF: Lot 12, Block 57, REPLAT OF ST. PETERSBURG BEACH SUB-DIVISION, as recorded in Plat Book 5, Pages 28-29 of the Public Records of Pinellas County, Florida.

- |||| - NEW VINYL FENCE
- EXISTING CONCRETE TO BE REMOVED
(REPLACE WITH SHELL)
- TV'S
- NEW BARRIER LANDSCAPE
- TRASH RECEPTACLES



**TECHNICAL REVIEW COMMITTEE MEETING
CITY OF ST. PETE BEACH
COMMISSION CHAMBERS**

Agenda Report

Agenda Title Name: Conditional Use Permit 26117: 20th Ave Street-end (Lift Station #4)

Action Request:

Strategic Objective:

Date: August 5, 2026

Prepared By: Brandon Berry, Senior Planner

Through: Laura Canary, Community Development Director

Summary of Issue: The City of St. Pete Beach requests a conditional use permit for public facility improvements at the street-end of 20th Avenue east of Pass A Grille Way, including installation of an elevated generator and platform, exchange of electrical control panels, and installation of screening fencing with curb improvements. Adjacent zoning of CG-1.

Funding: N/A

Attachments:

1. Application
2. Asbuilt Survey
3. CUP Application Support
4. Existing LS Exhibit
5. Plans
6. Project Background
7. Sketch & Description
8. Technical Specifications



INFORMATION ON THE CONDITIONAL USE

What is a Conditional Use? A conditional use is a use that has operational, physical and other characteristics that may be different from those of the predominant permitted uses in a zoning district, but which is a use that compliments or may otherwise be compatible with the intended overall development within a district, provided the specified standards are met.

How do I apply for a Conditional Use? An applicant for conditional use must submit the following documents to the Community Development Department, based on the type of project proposed.

All Conditional Use Permits

- A complete and signed application. Incomplete applications will not be processed and will be returned. As such, all applicants are **STRONGLY ENCOURAGED** to meet with Community Development staff prior to submission deadlines to discuss plan submissions and the review process. Appointments can be made by calling 727.363.9229.
- A completed and signed agent authorization form if someone else will be representing the property owner at the public hearing.
- An accurate, legible, and appropriately scaled survey of the property including all existing improvements. The survey shall have been performed not more than one (10) years prior to the date of application and not less than two (2) 11"x17" copies of the survey are required for submittal. If improvements have been made to or altered on the property since the survey was performed, a new survey must be performed. Please note that an ALTA/ACSM survey completed within the past year must be submitted with application for a site plan if the conditional use permit request is approved. Applicants may wish to consider having an ALTA/ACSM survey performed at this stage to avoid unnecessary revisions during site plan submittal.
- Two scaled conceptual site plans depicting the request. The site plans can be sized from 8.5"x11" to a maximum of 24"x36" in size. These drawings are necessary to assist staff and the BOA or City Commission in the review of the request. The site plans shall contain a matrix showing the site's preliminary compliance with the zoning district's dimensional and area requirements, which can be found in the Land Development Code (LDC) under the property's zoning district. The matrix shall a column listing the LDC requirements for setbacks, density (where applicable), intensity/FAR (where applicable), minimum lot area (where applicable) impervious surface ratio, and parking, with an additional column demonstrating how the plan will comply with those standards.
- When the application involves new building construction, additions or expansions, new placement of parking, a change of use, or other construction that triggers heightened landscaping requirements in LDC Sec. 22.7., 22.8, or 39.10, a preliminary landscaping plan shall be submitted that references the LDC requirement(s) for the affected area(s) of the site and the installation of landscaping to meet such

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requirement(s). The plan may show specific species, caliper and planting height if known, or provide a schedule of landscaping to be installed if the conditional use permit request is approved.

- Cash or check made payable to the City of St. Pete Beach for the amount of the application plus mailing fees. The application fee is \$500. The mailing fee can be calculated for you when you turn in your application, or you can calculate it yourself by searching for your property on the Pinellas County Property Appraiser's office website (www.pcpao.gov), clicking on radius search at the top of the page, typing in 500 feet for the radius, and multiplying the number of properties times the current stamp price plus \$0.20.
- A completed Sign Posting Affidavit.
- Completed and filed lobbyist registration form(s), if relevant. Please submit these forms to the St. Pete Beach City Clerk's Office.
- Staff may request additional information, if necessary.

Applications for New Buildings, Expansions or Additions

In addition to the elements above, the following is required of all conditional use permits involving new building construction, or expansion of an existing building. This list is not comprehensive, and additional requests may be made to assess compatibility of the request with the Comprehensive Plan and Land Development Code.

- Elevations showing all sides of the building, in color, noting the following:
 - Height from grade to the top of the roof and top of the highest element of the structure, inclusive of elevator shaft overruns, antennae, mechanical equipment, covered rooftops, and similar non-habitable spaces.
 - Height from Base Flood Elevation to the top of the roof and top of the highest element of the structure.
 - For properties in the Community Redevelopment District, preliminary notation demonstrating the ability of the new building or addition to comply with the design objectives of LDC Sec. 39.7. and 39.8.
 - For properties in the Downtown Redevelopment District, preliminary notation demonstrating the ability of the new building or addition to comply with the design objectives of LDC Sec. 39.3, 39.7, and 39.8.
- When the project takes place within the Community Redevelopment District, a site plan shall be submitted noting the following. This can be depicted on the site plan required under the prior section if legible, or as a separate plan.
 - Streetscape and site design elements of LDC Sec. 39.10., 39.11., and 39.12., as well as LDC Sec 39.15. when the development abuts single-family, two-family, RU-1, or RU-2 zoned properties.
 - In addition to the preceding, any new buildings or additions within the Downtown Redevelopment District shall note compliance with the relevant elements of LDC Sec. 39.3. and 39.4. (where applicable).
- When the project is estimated to generate 51 or more peak hour trips based on the latest Institute of Transportation Engineers Parking Generation Manual or other professionally-accepted estimates, the applicant shall submit a transportation study methodology and draft transportation management plan (TMP) for review if requested by the City. Projects estimated to generate more than 300 peak hour trips are required to submit a transportation study methodology and TMP for review. Methodologies shall contain a table showing the expected traffic impact at peak hour for the new development.
- When the new building or addition exceeds 5,000 square feet, at least one rendering shall be provided showing the frontage of the building facing any public thoroughfare, and the rear of any building facing a public waterway or the beach. If the development site cannot be captured in one rendering, additional

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renderings shall be required to depict the new building(s) or addition(s) within the context of the entire development site.

- When the development is in the Community Redevelopment District and proposes a new building or is undergoing major renovation, an explanation of how the development will comply with the requirements of LDC Sec. 39.9.
- When the development is a multi-building project, or one with multiple uses in the same building, a preliminary site layout plan shall be provided identifying the uses provided within each building or portion thereof.
- A preliminary sign permit package, showing any proposed new signage for the property.

Applications for New and Expanded Temporary Lodging Developments

In addition to the elements in the preceding two sections, any new or expanded temporary lodging use shall provide the following. This list is not comprehensive, and additional requests may be made to assess compatibility of the request with the Comprehensive Plan and Land Development Code.

- Demonstration of compliance with the floor area standard of LDC Sec. 6.6.
- For properties in the Community Redevelopment District, demonstration of compliance with LDC Sec. 39.6.
- For large scale redevelopment projects in the Community Redevelopment District, site plan references to required beach walks, mean high water line easements, and any other public easement proffered under the development request.
- For large scale redevelopment projects in the Community Redevelopment District that contain at least one building exceeding 50 feet, a shade study at the equinox and solstices, showing at least one morning, afternoon and evening rendering.
- A to-scale dune installation or maintenance plan, where required.

Can I ask for Variance with my Conditional Use application? It is not uncommon for projects that require conditional use approval to also seek variance approvals. The City Commission is authorized to hear both types of request at the same time. Accordingly, variance requests may be included as part of the Conditional Use request. An additional application form is included in this packet for this purpose.

Who decides if the Conditional Use should be granted? The City Commission is authorized to hear and make final determinations on all conditional use requests. Conditional use applications may also include variance requests as part of a conditional use application. In those cases, the City Commission also makes the final determination.

What is the City Commission and when do they meet? The City Commission is the elected body of officials who have overall responsibility for establishing policies and procedures for the operations of the City of St. Pete Beach. The Commission meetings are normally held two times a month on the second and fourth Tuesday at 6:00pm, in the City Commission Chambers at 155 Corey Avenue (City Hall).

What do I do after my Conditional Use is granted? You will receive a notice from the City immediately following your hearing. This notice is called a Development Order (DO) and it will summarize the results of the hearing including the decision to deny, approve, or approve with conditions. If approved, the owner/applicant will have one (1) year from the date the development order is signed to obtain a building permit for the proposed work. The permit must remain active during the life of the project. If a permit is not obtained within a year or if a permit does not remain active, the conditional use will expire.

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What happens if my approved Conditional Use is appealed? Although rare, sometimes a neighbor or other affected party will appeal the Commission decision to the Circuit Court. Any such appeal must be taken within 30-days from the date of the decision. Should this occur, the City is normally removed from the appeal process and has no control over the timeframe or decision of the Court. The one-year timeframe for permit issuance noted above would begin from the Court's final decision date provided the applicant has properly advised the City of said appeal.

What can I do if my Conditional Use is not granted? You may correct your plans to meet current code requirements or you may file an appeal to the Pinellas County Circuit Court with 30-days of the final decision.

How are my application fees used? The application fee is primarily used to cover staff review costs. A conditional use application will typically involve reviews from multiple City agencies and may include County, State, or even Federal reviews depending on the nature of the request. All conditional use applications are required to be properly advertised and require notification to adjacent property owners. The mailing fees are used offset the cost incurred in meeting these requirements including the preparation of a legal ad and mailing costs associated to adjacent property owner notice. The City shall re-advertise a request, at no expense to the applicant, if a scheduled application is not heard due to an error by the City (i.e. lack of a quorum). Otherwise, the applicant will be responsible for any additional costs incurred as a result of his or her own (in)action.

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CONDITIONAL USE APPLICATION

Applicants must acknowledge understanding of the following. Initial each of the statements below. If you do not understand any of these, staff will explain them to you.

AP

I understand that the City will not accept or process an incomplete application.

AP

I understand that a non-conforming use or structure in a particular zoning district does not, in any way, provide justification for the granting of a conditional use. Furthermore, the existence of a permitted use or structure in adjacent districts does not constitute grounds for a conditional use.

AP

On all conditional uses, a majority vote is required. Action on this application by the City Commission may be continued to a later meeting.

AP

I understand that if a conditional use is approved by the City Commission, the applicant is required to obtain the appropriate building permits within 1 year from the date of the decision. If no permit is obtained within 1 year, the approval from the City Commission becomes voided.

AP

I understand that any person aggrieved by the final decision has the right to file a petition in the Pinellas County Circuit Court within 30 calendar days after the decision. Permits for construction may be granted prior to the expiration of this 30-day period, but an appeal will be grounds for revocation of the permit.

AP

I understand that I, as the applicant, or my authorized representative must be present at all scheduled public meetings on the application.

After acknowledgement of these conditions, complete the application form on the following pages

Adam Poirrier

Adam Poirrier (Jul 6, 2026 09:54:26 EDT)

Jul 6, 2026

Signature of Applicant

Date

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CONDITIONAL USE APPLICATION

Case Number: _____

PROPERTY OWNER: City of St. Pete Beach

APPLICANT/AGENT (Attach agent authorization form)

Name: City of St. Pete Beach

Name: Adam Poirrier

Address: 155 Corey Avenue

Address: 155 Corey Avenue

City: St. Pete Beach State: Florida

City: St. Pete Beach State: Florida

Zip: 33706 Telephone: 727-363-9232

Zip: 33706 Telephone: 727-363-9804

Email: frobustelli@stpetebeach.org

Email: apoirrier@stpetebeach.org

SUBJECT PROPERTY:

Address: (nearest) 1901 Pass-a-Grille Way

Current Name of Business: City of St. Pete Beach

Parcel ID: N/A - Public Right-of-Way

Name of Project: Pump Station No. 4 Rehabilitation & Flood Mitigation

DETAILS OF THE REQUEST, INCLUDING APPLICABLE CODE SECTIONS AND ANY ASSOCIATED CASES (Add additional sheets if necessary):

This project involves the rehabilitation and flood mitigation of the existing wastewater Lift Station No. 4 including but not limited to:

Cleaning Existing Valve Vault Including Removal of Debris and Sand Blasting and Recoating of Existing Fittings;

Electrical Equipment Rack Including Pump Control Panel (5 HP - 7.5 HP), Meter, Main Disconnect, Automatic Transfer Switch, Junction Box, and Relocation of SCADA Panel; Elevated Platform; Backup Generator, Enclosure, and Sub-Base Fuel Tank;

Site Lighting; 6 Feet Tall Vinyl Privacy Fence; 6 Feet Tall, 4 Feet Wide Vinyl Privacy Access Gate; Curb Installation; Potable Water Service and Hose Bib Relocation; Demolition; Shell Restoration

Adam Poirrier

Adam Poirrier (Jul 6, 2026 09:54:26 EDT)

Signature of Applicant/Agent

Jul 6, 2026

Date

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In order for an application for a conditional use to be approved or approved with conditions, the City Commission must make a positive finding with regard to each of the provisions below, pursuant to Division 4 of the City's Land Development (LDC). The applicant has the burden of proof demonstrating that the application for the conditional use complies with each of the requirements. Please explain in detail how your case meets these requirements (attach additional sheets if necessary):

1. LDC Sec 4.4(a)(1) Whether the conditional use is consistent with the goals, objectives, and policies of the Comprehensive Plan and any adopted special area plan.

See attachment

2. LDC Sec 4.4(a)(2)a-d Whether the proposed use will be compatible with the character of the existing area, including existing structures and structures under construction, existing public facilities and public facilities under construction, and residential commercial and/or service facilities available within the existing area. More specifically:

- a. Whether the overall appearance and function of the area will be significantly affected. consideration shall be given to the existence of other uses in the area, based on the number, size, and location of the uses and the intensity and scale of the proposed and existing uses in the area;

See attachment

- b. Whether the application will preserve any city, state, or federally designated historic, scenic, archaeological, or cultural resources (check with Community Development to determine historic resource status);

See attachment

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- c. Whether the application will be compatible with adjacent development, if any, based on characteristics such as size, building style and scale, or whether such incompatibilities are mitigated through such means as screening, landscaping, setbacks, and other design features;

See attachment

- d. Whether the application will have significant adverse impacts on the livability and usability of nearby land due to noise, dust, fumes, smoke, glare from lights, late-night operations, odors, vehicular traffic, truck and other delivery trips, the amount, location, and nature of any outside activities, potential for increased litter, or privacy and safety issues;

See attachment

- 3. Whether the transportation system is capable of adequately supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street capacity and level of service, access to arterials, transit availability, on-street parking impacts, if any, site access requirements, neighborhood impacts, and pedestrian safety (a traffic study may be required);

See attachment

- 4. Whether the minimum off-street parking area required and the amount of space needed for the loading and unloading of trucks, if applicable, will be provided and will function properly and safely (please provide current and proposed number of parking and loading spaces);

See attachment

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5. Whether generally, the public health, safety and welfare will be preserved, and any reasonable conditions necessary for such preservation have been made;

See attachment

6. Whether the applicant has demonstrated the financial and technical capacity to complete any improvements and mitigation necessitated by the development as proposed and has made adequate legal provision to guarantee the provision of such improvements and mitigation; and,

See attachment

7. The proposed use complies with all additional standards imposed on it by the particular provision of these regulations authorizing such use and by all other applicable requirements of the regulations of the City of St. Pete Beach.

See attachment

Sec. 4.12 of the Land Development Code additionally requires conditional use applications within the community redevelopment district to be evaluated upon the extent to which the applicant can demonstrate that the following issues are addressed in a manner consistent with the policies established in the community redevelopment plan for the district and that no unreasonable or disproportionately negative impacts are imposed upon adjacent or nearby properties:

1. Utility infrastructure, including sanitary sewer, reclaimed water, potable water, electric and natural gas services, and data transmission and telecommunication services.

See attachment

2. Transportation infrastructure, including ingress and egress from public right-of-way, traffic control devices and signalization, internal vehicle circulation of the site, design and function of parking areas, loading and unloading areas, pedestrian transit infrastructure and amenities, and public sidewalks and roadways.

See attachment

3. Hydrological features and storm water management infrastructure.

See attachment

4. Aesthetic and architectural features of the development, including site layout, physical dimensions of structures such as height and massing, design and appearance of building facades, exterior building materials, advertising and directional signage and the provision and maintenance of Gulf and Bay views and vistas.

See attachment

5. Site landscaping, open space provision and impervious surface limitations.

See attachment

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6. Operational and functional requirements of facilities, including hours of operation, provision of required services or amenities, lighting requirements, noise abatement requirements, residency limitations and facilities maintenance. See attachment
7. Fire suppression and facility security. See attachment
8. Emergency management and hurricane evacuation provisions. See attachment
9. For temporary lodging uses taller than 50 feet in height or a density greater than 30 units per acre, the following additional issues shall be considered:
 - a. The amount of separation provided between the proposed temporary lodging use and any existing buildings on adjoining properties and resulting impact on sunlight and views; and
 - b. The proximity of any adjacent residential building to the Florida Coastal Construction Control Line and the degree to which the proposed temporary lodging use and/or any accessory use or structure maintains an open view of the waterfront from neighboring properties.

See attachment

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Technical Review Committee Deadlines

The TRC generally meets the 1st and 3rd Wednesday of each month at 10:00am in the Community Development Department conference room. All conditional use permit applications must be reviewed by the Technical Review Committee.

Meeting Month	Application Deadline	Meeting Date
	30 days prior to meeting date	At 10:00am in the TRC room
Wednesday		
January	12/9/2024	1/8/2025
	12/23/2024	1/22/2025
February	1/6/2025	2/5/2025
	1/20/2025	2/19/2025
March	2/3/2025	3/5/2025
	2/17/2025	3/19/2025
April	3/3/2025	4/2/2025
	3/17/2025	4/16/2025
May	4/7/2025	5/7/2025
	4/21/2025	5/21/2025
June	5/5/2025	6/4/2025
	5/19/2025	6/18/2025
July	6/2/2025	7/2/2025
	6/16/2025	7/16/2025
August	7/7/2025	8/6/2025
	7/21/2025	8/20/2025
September	8/4/2025	9/3/2025
	8/18/2025	9/17/2025
October	9/1/2025	10/1/2025
	9/15/2025	10/15/2025
November	10/6/2025	11/5/2025
	10/20/2025	11/19/2025
December	11/3/2025	12/3/2025
	11/17/2025	12/17/2025

CITY OF ST. PETE BEACH, Community Development Department
155 Corey Avenue, St. Pete. Beach, Florida 33706, 727-367-2735 www.stpetebeach.org

https://stpetebeach-my.sharepoint.com/personal/itd_stpetebeach_org/Documents/Network-Shares/Q-CommunityDevelopment/Admin Docs/Application Forms/Conditional Use/Conditional_Use App 2025.doc 11



Owner's Authorization for Agent

I/WE City of St. Pete Beach
(print name of property owner)

hereby authorize Adam Poirrier
(print name of agent)

to represent me/us in an application for Conditional Use Permit
(type of application: variance, conditional use, zoning, etc.)

Frances Robustelli

Frances Robustelli (Aug 6, 2025 09:41:17 EDT)

Signature of Owner

Signature of Owner

City of St. Pete Beach

Print Name of Owner

Print Name of Owner

The forgoing instrument was acknowledged before me on this 4th day of August 2025, by Frances Robustelli ~~who is personally known to me~~ or produced identification.

(Notary Signature)



RITA BISHOP
Notary Public
State of Florida
Comm# HH670184
Expires 4/28/2029
8/4/2025

(Date)

My Commission Expires 04/28/2029

CITY OF ST. PETE BEACH, Community Development Department
155 Corey Avenue, St. Pete. Beach, Florida 33706, 727-367-2735 www.stpetebeach.org

https://stpetebeach-my.sharepoint.com/personal/itd_stpetebeach_org/Documents/Network-Shares/Q-CommunityDevelopment/Admin Docs/Application Forms/Conditional Use/Conditional_Use App 2025.doc 12



PUBLIC HEARING SIGN POSTING AFFIDAVIT

Applicant, City of St. Pete Beach, agrees to post the sign(s) in a conspicuous place, at the principal access to the property, in full view of the public, and not more than five (5) feet from the nearest street right of way or easement a minimum of seven (7) days in advance of the Public Hearing and remain in place until the requested action has been heard and decided. Multiple sign postings shall not be more than three hundred (300) feet apart. If the subject parcel(s) abut more than one (1) street, notices shall be posted along each street. When the subject parcel(s) does not front a public road, the sign shall be posted at the point on a public road by which the property is, or can be, reached.

The sign shall be maintained in good readable condition by the applicant. If the said sign is destroyed, lost, or becomes unreadable, the applicant or applicant's representative shall obtain a replacement sign. Any sign posted in accordance with these requirements shall be removed from the property and disposed of by the applicant or applicant's agent not later than 24 hours following the final decision.

Applicant/Agent (must fill out agent authorization form):

Name(print): Adam Poirrier

Address: 155 Corey Avenue St. Pete Beach, 33706

Adam Poirrier
Adam Poirrier (Jul 6, 2026 09:54:26 EDT)
Signature

Jul 6, 2026
Date

STATE OF FLORIDA)
) SS:
PINELLAS COUNTY)

The foregoing instrument was acknowledged before me this 10th day of July 20 26 by Adam Porrier, who appeared before me, and is personally known to me, or has produced _____ as identification, and did take an oath.

My commission expires: _____



RYTA BISHOP
Notary Public
State of Florida
Comm# HH670184
Expires 4/28/2029

NOTARY: [Signature]
Print Name: Rita Bishop
Notary Public, State of Florida
(Notarial Seal)

CITY OF ST. PETE BEACH, Community Development Department
155 Corey Avenue, St. Pete. Beach, Florida 33706, 727-367-2735 www.stpetebeach.org

DEAR APPLICANT:

PLEASE COMPLETE THE ATTACHED AFFIDAVIT WHEN PUBLIC HEARING DATES HAVE BEEN DETERMINED FOR YOUR APPLICATION. PRESENT THE COMPLETED NOTARIZED AFFIDAVIT TO COMMUNITY DEVELOPMENT AND YOU WILL BE GIVEN THE SIGN(S) TO POST ON THE SUBJECT PROPERTY.

It is your responsibility to post the sign(s) in a conspicuous place, at the principal access to the property, in full view of the public, and not more than five (5) feet from the nearest street right of way or easement a minimum of seven (7) days in advance of the public hearing. The sign(s) must remain in place until the requested action has been heard and decided by the City Commission, Planning Board, Board of Adjustment, Historic Preservation Board or withdrawn. Multiple sign postings cannot be more than three hundred (300) feet apart. If the subject parcel(s) abut more than one (1) street, notices shall be posted along each street. When the subject parcel(s) does not front a public road, the sign shall be posted at the point on a public road by which the property is, or can be, reached.

You must maintain the sign(s) in good readable condition. If the said sign is destroyed, lost, or becomes unreadable, you or your representative shall obtain a replacement sign. Any sign posted in accordance with these requirements shall be removed from the property and disposed of by the applicant or applicant's representative not later than 24 hours following the final decision by the City Commission, Planning Board, Board of Adjustment, or Historic Preservation Board.

A Notary Public is available in City Hall; 155 Corey Avenue.

CITY OF ST. PETE BEACH, Community Development Department
155 Corey Avenue, St. Pete. Beach, Florida 33706, 727-367-2735 www.stpetebeach.org

https://stpetebeach-my.sharepoint.com/personal/itd_stpetebeach_org/Documents/Network-Shares/Q-CommunityDevelopment/Admin Docs/Application Forms/Conditional Use/Conditional_Use App 2025.doc 14

ANNUAL LOBBYIST REGISTRATION

FOR THE PERIOD JANUARY 1, ____ THRU DECEMBER 31, _____

Name _____ Phone _____ Email _____

Mailing Address _____

NAMES OF INDIVIDUAL LOBBYISTS (attach additional sheets if necessary):

- 1) Name _____
- 2) Name _____
- 3) Name _____
- 4) Name _____

Business Relationships: Does the Lobbying Firm or any of the Lobbyists listed above have any direct business association or partnership with any current member of the City Commission, City employee, or person sitting on a decision-making body (mark one)?

☐ Yes ☐ No

If "yes", attach documentation explaining the nature of each business relationship.

List any local campaign contributions and the amount(s):

LIST THE NAME AND BUSINESS ADDRESS OF EACH PRINCIPAL REPRESENTED, THEIR GENERAL AND SPECIFIC AREAS OF LEGISLATIVE INTEREST, AND THEIR POSITION ON SUCH AREA OF INTEREST.

(1) Name _____

Address _____

General Area of Legislative Interest: _____

Specific Area of Legislative Interest: _____

Position on Area of Interest: _____

(2) Name _____

Address _____

General Area of Legislative Interest: _____

Specific Area of Legislative Interest: _____

Position on Area of Interest: _____

(3) Name _____

Address _____

General Area of Legislative Interest: _____

Specific Area of Legislative Interest: _____

Position on Area of Interest: _____

(4) Name _____

Address _____

General Area of Legislative Interest: _____

Specific Area of Legislative Interest: _____

Position on Area of Interest: _____

(USE ADDITIONAL PAGES IF NECESSARY)

Be advised:

- 1) Completed forms may be scanned and emailed to cityclerk@stpetebeach.org, hand delivered, or mailed to the address below. For those submitting electronically, **registration does not become effective until all fees have been paid and the form has been reviewed and approved by staff.** Staff review will verify all required information has been provided and an effective date will be communicated to registrant.
- 2) This registration expires at 11:59 p.m. on December 31st. A new registration must be filed each year.
- 3) The registration fee is \$50.00, in compliance with the City's Code of Ordinances.
- 4) A revised registration may be submitted throughout the year to add or remove principals and/or individual lobbyists. No charge is required to amend a registration throughout the year. If the general or specific area of legislative interest changes, written notification shall be filed with the City Clerk reflecting such amendments, and such notification shall be made prior to lobbying on any new subject.

By submission of this form, you are attesting that the firm and lobbyist(s) listed above have been retained to represent each principal listed above.

OATH

Under penalties of perjury, I declare that I have read the foregoing document and that facts stated in it are true.

Signature

Printed Name

Title

Date

Submit form with registration fee made payable to the City of St. Pete Beach.

Scanned forms may be emailed to cityclerk@stpetebeach.org

Notice: Cash or Check ONLY. Credit/Debit cards are not accepted.

City of St. Pete Beach
City Clerk's Office
Attn: City Clerk
155 Corey Avenue
Ste. Pete Beach, FL 33706

Registration Fee Paid and Form Accepted: _____
Staff Initial

GENERAL AND SPECIFIC AREAS OF LEGISLATIVE INTEREST

When completing the registration form, registrants shall provide a response for both the “General” and “Specific” area of legislative interest, as required by City Code. Registrants are required to disclose both the “General” and “Specific” areas of legislative interest with sufficient specificity to permit a reasonable individual to clearly associate a lobbyist’s activities to an issue disclosed on the lobbyist’s registration form(s). If a lobbyist is representing a client on multiple issues, each issue must be disclosed separately, and the general & specific nature of each issue must be disclosed in such a manner to permit clear identification of each issue separate and apart from other issues listed on the registration forms. If necessary, the registrant should attach additional pages to their registration forms to clearly disclose all information required by the Lobbyist’s Registration Ordinance.

Issue and Position

It is important to note that lobbyists are required to disclose their principal’s position on an issue. In other words, lobbyists are required to state whether their principal is seeking the passage, defeat, withdrawal, etc. The registration form requires that the area of legislative interest and the position be sufficiently disclosed.

Registrations must also be updated timely to disclose any new/additional issues for which the lobbyist has been retained; registration forms must be updated prior to lobbying activities commencing.

Sufficient Disclosure

When lobbying on issues pertaining to a specific ordinance, resolution, planning department action, etc., the registrant shall refer to the specific identifier associated with the issue – i.e. ordinance no., resolution no., permit no., or other City-issued identifier associated with the subject matter. In most cases, this identifier, along with the issue’s official City title, constitutes the “Specific” area of legislative interest.

On issues which lack a City issued identifier, the registrant must identify the issue with sufficient specificity to give public notice of the particular issue or proposal that is a subject of any communication that constitutes lobbying. This may be accomplished by identifying a specific property (street address or parcel ID) or by identifying a specific agenda item (meeting date, item no., title). For issues relative to real property, the “Specific” disclosure should clearly identify the exact location of the real estate.

With regards to the City budget, it is likely necessary to disclose a specific appropriation, funding topic, program, City department, or other unique element that pertains to the lobbying activities. Merely disclosing that lobbying activities pertain to “the budget” is too vague and, therefore, would constitute an insufficient disclosure.

Upon request, staff of the Clerk’s Office will provide advice to registrants with regards to the “General” and “Specific” responses. Please contact our office if guidance is needed.

Ordinance 2022-04

AN ORDINANCE OF THE CITY OF ST. PETE BEACH, FLORIDA AMENDING THE CODE OF ORDINANCES, CHAPTER 2 – ADMINISTRATION, ARTICLE II - OFFICERS AND EMPLOYEES, DIVISION 2 - CODE OF ETHICS, ESTABLISHING SECTION 2-68 - DEFINITIONS; SECTION 2-69 - REGISTRATION OF LOBBYISTS; SECTION 2-70 – VALIDITY OF ACTION; SECTION 2-71 – RECORD KEEPING RESPONSIBILITIES; SECTION 2-72 – MAINTAINING REGISTRATIONS AND CONTACT LOGS; SECTION 2-73 – PROHIBITED CONDUCT OF CITY OFFICIALS AND EMPLOYEES; SECTION 2-74 – COMPLIANCE; PENALTIES, AND RESERVING SECTIONS 2-75 – 2-95; PROVIDING FOR CODIFICATION; CONFLICTS; SEVERABILITY; CORRECTION OF SCRIVENER’S ERROR; CONSTRUCTION; PUBLICATION; AND AN EFFECTIVE DATE.

WHEREAS, the City Commission of the City of St. Pete Beach wishes to establish registration and regulations for lobbying and lobbyists within the City.

WHEREAS, the Code of Ordinances Chapter 2, Article II, Division 2 “Code of Ethics” does not currently include any specific regulations related to lobbyists.

WHEREAS, the City Commission desires to establish a system to track lobbying activities to allow for greater transparency in City business.

WHEREAS, persons appearing before the City Commission, City staff, City boards, and City Committees benefit from having Lobbyist registration requirements that are consistent and uniform.

WHEREAS, the City Commission finds it in the best interest of its citizens to preserve and maintain the integrity of the members of the City Commission, board, committee and City employees.

NOW, THEREFORE, THE CITY COMMISSION OF THE CITY OF ST. PETE BEACH FLORIDA, HEREBY ORDAINS:

SECTION 1. Recitals. The above recitals (“Whereas” clauses) are hereby adopted as legislative findings, purpose and intent of the City Commission.

SECTION 2.

Chapter 2, Article II, Division 2 shall be amended as follows:

Sec. 2-68 – Definitions.

The following terms will be defined for this Section:

Lobbying – means communications, whether written or oral, by a lobbyist outside a duly noticed public meeting or hearing on the record with any member or members of the City Commission, or any member or members of any decision making body under the jurisdiction of the City Commission, or any City employee, whereby the lobbyist seeks to encourage or influence the passage, defeat, modification or repeal of any item which may be presented for vote before the City Commission, or any decision-making body under the jurisdiction of the City Commission, or which may be presented for consideration by a City employee as a recommendation to the City Commission or decision-making body.

Lobbyist – means all persons employed or retained, whether paid or not, by a principal who seeks to encourage the passage, defeat or modification of any ordinance, resolution, action or decision of any City Commissioner; any action, decision, recommendation of the City manager or any City board or committee; or any action, decision or recommendation of any City personnel defined in any manner in this section, during the time period of the entire decision-making process on such action, decision or recommendation that foreseeably will be heard or reviewed by the City Commission, or a City board or committee. The term specifically includes the principal as well as any employee engaged in lobbying activities. The term "lobbyist" specifically excludes the following persons:

- i) Expert witnesses who provide only scientific, technical or other specialized information or testimony in public meetings; ii) any person who only appears as a representative of a neighborhood association without compensation or reimbursement for the appearance, whether direct, indirect or contingent, to express support of or opposition to any item; and iii) any person who only appears as a representative of a not-for-profit community based organization for the purpose of requesting a grant without special compensation or reimbursement for the appearance.

The persons specifically excluded above from the definition of "lobbyist" shall, prior to communicating with City personnel, disclose in writing to the City clerk, their name, address, and principal on whose behalf they are communicating.

Lobbying firm – means a business entity, including an individual contract lobbyist, that receives or becomes entitled to receive any compensation or the purpose of lobbying, where any partner, owner, officer, or employee of the business entity is a lobbyist.

Principal – means a person, firm, corporation, or other legal entity which has employed or retained a lobbyist.

Employee – means all persons employed directly or indirectly by the City of St. Pete Beach.

Decision-making body – means any board or committee established by the City Commission, City Manager and/or committee appointed by the City Manager.

Sec. 2-69 – Registration of lobbyists.

All lobbyists, as defined herein, shall register with the City Clerk on an annual basis, January 1 each year, including the payment of a \$50.00 fee, or as amended in Appendix A in the City's Code of Ordinances, prior to engaging in any lobbying. Registration shall be updated to add or withdraw principals and/or individual lobbyists before a lobbyist commences lobbying on behalf of any new principal. If the general or specific area of legislative interest changes, written notification shall be filed with the City Clerk reflecting such amendments, and such notification shall be made prior to lobbying on any new subject.

Each lobbyist shall be required to register on forms prepared by the City Clerk. The lobbyist shall state under oath his or her name, business address, the name and business address of each principal represented, that the principal has actually retained the lobbyist, the general and specific areas of legislative interest, position on such legislative interest, and the nature and extent of any direct business association or partnership with any current member of the City Commission, City employee, or person sitting on a decision-making body. Each lobbying firm may register in the name of such firm, corporation, or legal entity, provided the registration shall list the names of all persons who engage in lobbying as defined in this article. Failure to register, or providing false information in the lobbyist registration form, shall constitute a violation of this Ordinance.

Sec. 2-70 – Validity of action.

The validity of any decision, action, recommendation, or determination made by the City Commission, board, committee, or employee shall not be affected by the failure of any person to comply with the provisions of this Ordinance.

All members of the City Commission, boards, committees, and City employees shall be diligent to ascertain that a person required to register pursuant to this Ordinance have complied, and if necessary, request a record of compliance from the City Clerk.

Sec. 2-71 – Record keeping responsibilities.

City Commissioners, board members, committee members, and City employees, as defined in this Section shall be responsible for maintaining a written log, in the form established by the City Clerk, which documents each oral lobbying communication or meeting. The written log shall be on a form as prepared by the City Clerk. The log shall, at a minimum, reflect the name of the lobbyist, the date of the contact, whether telephone or in person oral contact, and the subject matter discussed.

City Commissioners, board members, committee members, and City employees shall deliver their logs to the City Clerk's Office at the end of each quarter and at the conclusion of their final term in office. City employees must deliver their logs to the City Clerk at the end of

each quarter and upon the conclusion of their employment with the City.

Sec. 2-72 – Maintaining registrations and contact logs.

The City Clerk shall accept and maintain the annual lobbyist registrations and the quarterly log of lobbyist contacts, which shall be open for public inspection.

Sec. 2-73 – Prohibited conduct of city officials and employees.

No member of the City Commission, board, committee or employee of the City shall solicit or accept as compensation, payment, favor, service, or thing of value from a lobbyist or principal when such member of the City Commission, board, committee or employee knows, or with the exercise of reasonable care, should know, that it was given to influence a vote or recommendation favorable to the lobbyist or principal.

No member of the City Commission or employee of the City shall appear before the City Commission for compensation for two years from the date he or she leaves the City Commission or City employment.

Sec. 2-74 – Compliance; penalties.

The City Clerk shall monitor lobbyists for compliance with this section and shall develop procedures for suspension of lobbyists until compliance is attained. The City Clerk will alert the City Commission to any instances of non-compliance and will inform the City Commission of any need to institute progressive penalties for repeat offenders.

The penalties for an intentional violation of this Ordinance more than once in a twelve-month period are as follows:

- 1) Second violation shall result in prohibition from lobbying for one year; and
- 2) Third violation shall result in prohibition from lobbying for two years.

Sec. 2-75 – Sec. 2-95 – Reserved.

SECTION 3. Codification. This Ordinance shall be codified in the Code of Ordinance of the City of St. Pete Beach.

SECTION 4. Conflicts. All ordinances or parts of ordinances, in conflict herewith are hereby repealed to the extent of any conflict with the Ordinance.

SECTION 5. Severability. The provisions of this Ordinance are declared to be severable, and if any section, sentence, clause or phrase of this Ordinance shall for any reason be held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining sections, sentences, clauses, and phrases of this Ordinance as they shall remain in effect, it being the legislative intent that this Ordinance shall stand notwithstanding the invalidity of any part.

SECTION 6. Scrivener's Error. The City Attorney may correct scrivener's errors found in this Ordinance by filing a corrected copy of this Ordinance with the City Clerk.

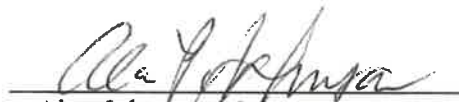
SECTION 7. Construction. This Ordinance is to be liberally construed to accomplish its objectives.

SECTION 8. Publication. This Ordinance shall be published in accordance with the requirements of law.

SECTION 9. Effective Date. This ordinance shall take effect on September 1, 2022.

FIRST READING: **January 25, 2022**
PUBLISHED: **February 9, 2022**
SECOND READING: **February 22, 2022**
PUBLIC HEARING: **February 22, 2022**

CITY COMMISSION, CITY OF ST. PETE
BEACH, FLORIDA.


Alan Johnson, Mayor

I, Amber LaRowe, City Clerk of the City of St. Pete Beach, Florida, do hereby certify that the foregoing Ordinance was duly adopted in accordance with the provisions of applicable law this 22 day of February, 2022.


Amber LaRowe, City Clerk

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:


Andrew Dickman, City Attorney

Application

Final Audit Report

2026-07-06

Created:	2026-07-06
By:	Rita Bishop (rbishop@stpetebeach.org)
Status:	Signed
Transaction ID:	CBJCHBCAABAAi_WPRID7o8tiISctLeEZYXPMEmfvG6nJ

"Application" History



Document created by Rita Bishop (rbishop@stpetebeach.org)

2026-07-06 - 1:35:19 PM GMT



Document emailed to Adam Poirrier (apoirrier@stpetebeach.org) for signature

2026-07-06 - 1:35:30 PM GMT



Email viewed by Adam Poirrier (apoirrier@stpetebeach.org)

2026-07-06 - 1:36:15 PM GMT



Document e-signed by Adam Poirrier (apoirrier@stpetebeach.org)

Signature Date: 2026-07-06 - 1:54:26 PM GMT - Time Source: server - Signature Appearance Selected: MOBILE_TYPE



Agreement completed.

2026-07-06 - 1:54:26 PM GMT



Adobe Acrobat Sign

LIFT STATION NO. 4 REHABILITATION

PREPARED FOR
CITY OF ST. PETE BEACH, FLORIDA
DECEMBER 2021

Surveyor's Report

- Type of Survey:**
- As-built Survey** in accordance with the Standards of Practice requirements of Chapter 5J-17 of the Florida Administrative Code, pursuant to Section 472.027.
- Map of Survey:**
- The map and report are not full and complete without the other.
- Description:**
- Not applicable.
- Accuracy:**
- Measurements, distances, elevations and features were performed in strict accordance with the Standards of Practice set forth in chapter 5J17 Florida Administrative Code.
 - Ferguson Land Surveyors, PLLC (FLS) survey control is based on robotic total station and/or RTK GPS observations to obtain repetitive measurements and meet the standards of accuracy.

- Data Sources:**
- Construction plans "Lift Station no.4 Rehabilitation" prepared by Kimley-Horn and Associates, Inc., telephone no. (727) 547-3999, Job no. 148404058, dated 12/21.
 - Bearings, distances and coordinates are in U.S. Survey Feet and based on construction plan (site) datum. (Data Sources 3)
 - Control point 1 to control point 2 serves as the monumented line bearing reference, being N.00°09'57"E.
 - Elevations shown here on are in U.S. Survey feet and are based on construction plan (site) datum. (Data Sources 3)
 - Onsite horizontal and vertical control points utilized for this survey: Control Point 1, found 1/2" iron rod, Northing 1223101.47 feet, Easting 418042.12 feet, Elevation = 3.41 feet and Control Point 2, found nail and disk, "NO ID", Northing 1223314.06 feet, Easting 418042.74 feet, Elevation = 3.42 feet. (Data Sources 3)

- Limitations:**
- Intent of Survey: To exhibit geospatial correlation of newly constructed entities to that of design.
 - Screened information shown on the map of survey is plan data (Data Sources 3), for comparison/ orientation purposes only and is not a part of the as-built survey. The **bold dark print and line work** is as-built information prepared by FLS, based on field mapped data together with information supplied by the installer.
 - There may be items drawn out of scale and / or moved on the map of survey to graphically show their location. Printed dimensions shown on the survey supersede scaled dimensions.
 - Use of this survey by anyone other than those prepared for / certified to, will be the re-users sole risk without liability to the surveyor.
 - Shown anywhere on this survey, the word "certify" is understood to be an expression of a professional opinion based upon the surveyor's best knowledge, information and belief, and that it constitutes neither a guarantee nor a warranty.

Prepared for and Certified to:

TLC Diversified, Inc.
2719 17th St. East
Palmetto, FL 34221
Tel: (941) 722-0621

BID SET



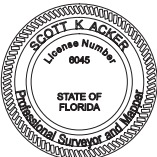
NEAREST ADDRESS:
1901 PASS A GRILLE WAY
ST. PETE BEACH, FL 33706



PROJECT VICINITY MAP

PREPARED BY
Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
100 2ND AVENUE SOUTH, SUITE 150N
ST. PETERSBURG, FL 33701
PHONE: (727) 547-3999
WWW.KIMLEY-HORN.COM CA 00000896



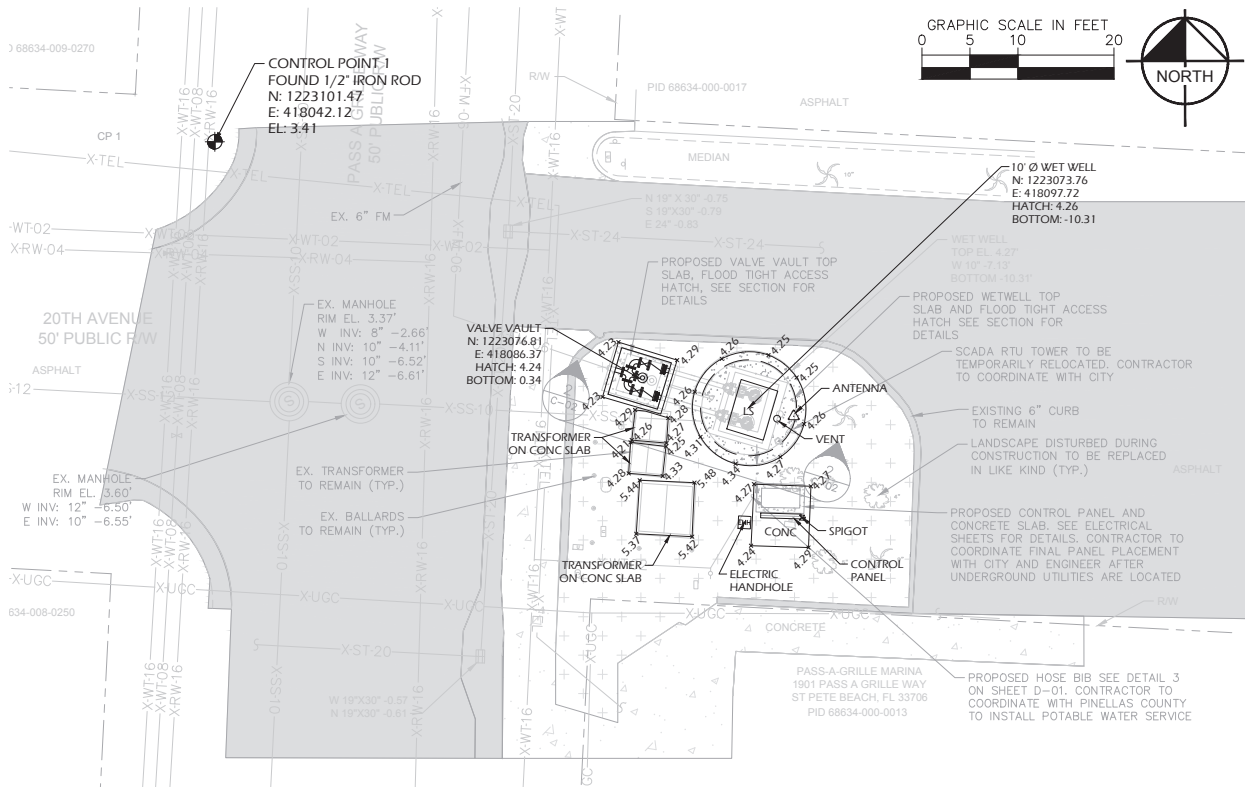
The seal appearing on this document was authorized by Scott K. Acker, LS 6045 on 12/15/2021

Survey map and report or the copies thereof are not valid without the original signature and seal of a Florida licensed Surveyor and Mapper, except those with electronic signature and electronic seal.

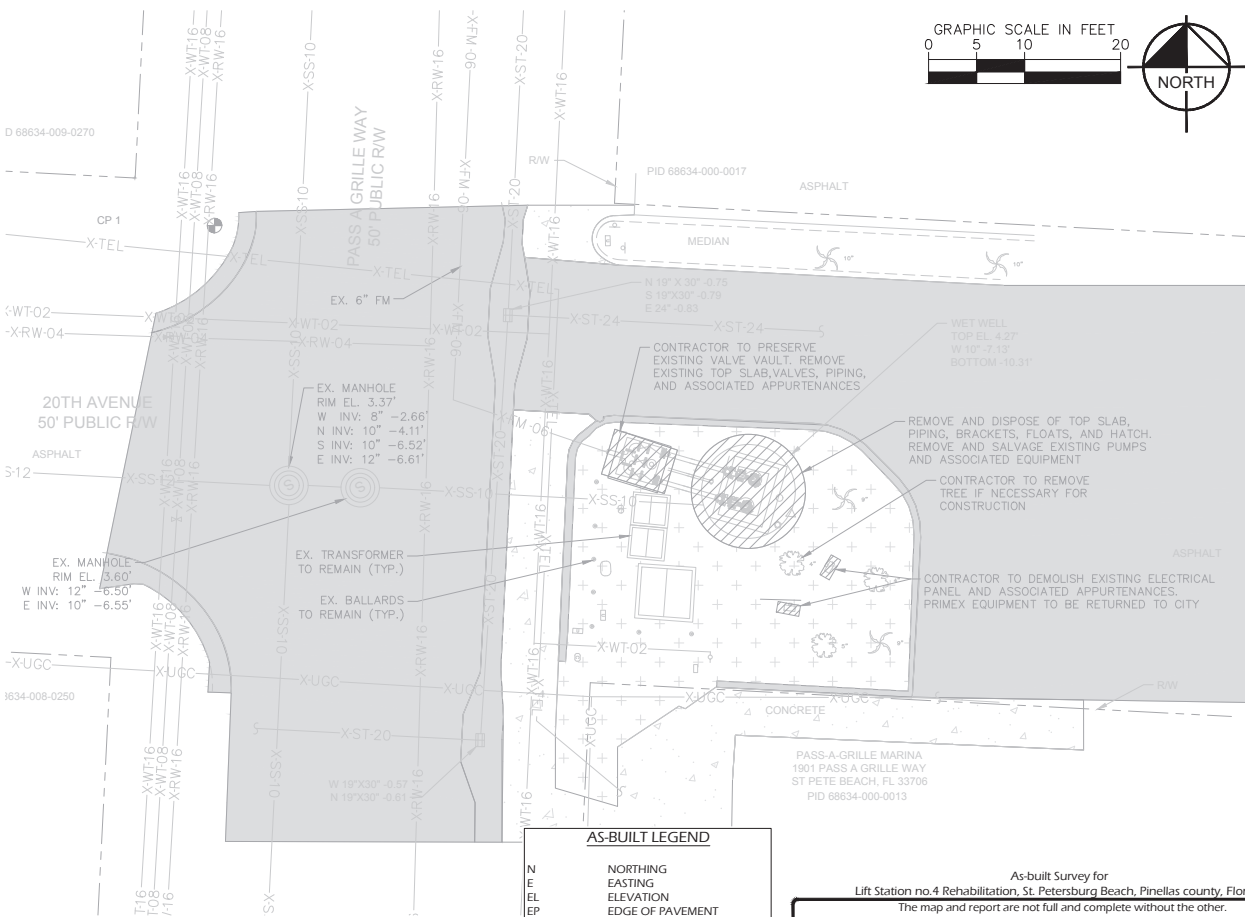
Scott K Acker
Digitally signed by Scott K Acker
Date: 2021.12.15 13:30:51 -05'00'
Scott K. Acker
Professional Surveyor and Mapper
License Number LS 6045
State of Florida

As-built Survey for Lift Station no.4 Rehabilitation, St. Petersburg Beach, Pinellas county, Florida The map and report are not full and complete without the other. See sheet (1) for Surveyor's Report and Certifications.		
FLS Project: 21101-A1		Project Manager: Scott
FB 555 Pg 22		Drawn by: Michael
Field Date: 11/23/2021		Sheet 1 of 2
806 Franklin Street, Clearwater, FL 33756 - Ph. 727.230.9606 Fax 727.230.9234 - LB No.: 8128		

AS-BUILT SURVEY
SHELBY N. HUGHES, P.E.
No. 86419



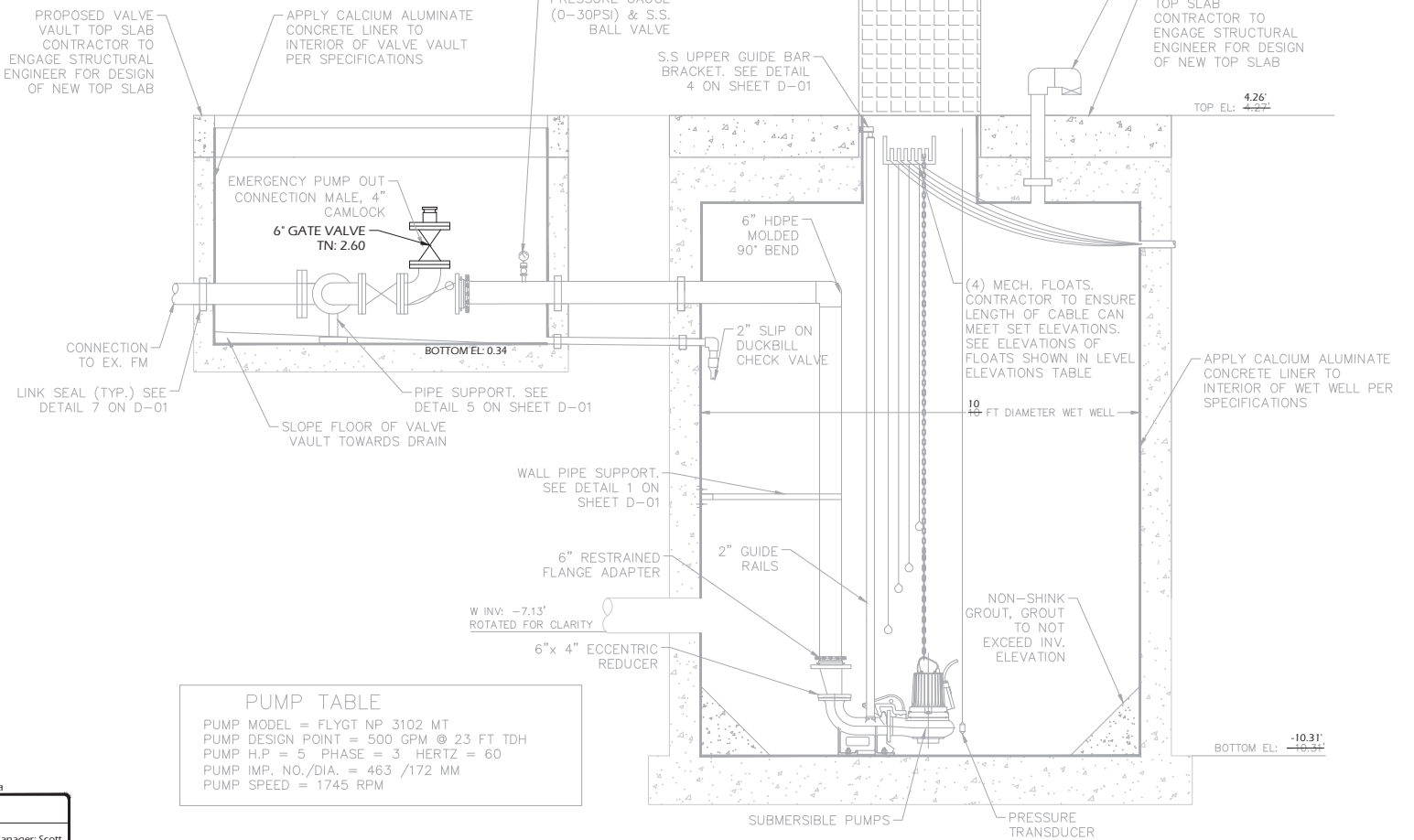
SITE PLAN



DEMOLITION PLAN

AS-BUILT LEGEND	
N	NORTHING
E	EASTING
EL	ELEVATION
ED	EDGE OF PAVEMENT
LF	LINEAR FEET
WM	WATER MAIN
HDPE	HIGH DENSITY POLYETHYLENE
RCP	REINFORCED CONCRETE PIPE
DIP	DUCTILE IRON PIPE
PVC	POLYVINYL CHLORIDE
ARV	AIR RELEASE VALVE
TP	TOP OF PIPE
TN	TOP OF NUT
CONC	CONCRETE

As-built Survey for Lift Station no.4 Rehabilitation, St. Petersburg Beach, Pinellas county, Florida	
The map and report are not full and complete without the other. See sheet (1) for Surveyor's Report and Certifications.	
FLS Project: 21101-A1	Project Manager: Scott
FB 555 Pg 22	Drawn by: Michael
Field Date: 11/23/2021	Sheet 2 of 2
806 Franklin Street, Clearwater, FL 33756 - Ph: 727.230.9606 Fax 727.230.9234 - LB No: 8128	



Conditional Use Permit Application Support

1. LDC Sec. 4.4(a)(1) – Consistency with the Comprehensive Plan

The proposed conditional use is consistent with the goals, objectives, and policies of the City of St. Pete Beach Comprehensive Plan. The project consists of flood mitigation and resiliency improvements supporting an existing municipal wastewater lift station and maintains the City's adopted level of service for wastewater collection. The improvements protect critical public infrastructure from flooding, improve operational reliability during utility outages, reduce emergency response costs, and implement an approved capital improvement project. The project supports the Future Land Use, Infrastructure, Recreation and Open Space, and Capital Improvements Elements by preserving essential public infrastructure while minimizing impacts to surrounding properties and public rights-of-way.

2. LDC Sec. 4.4(a)(2) – Compatibility with the Existing Area

The proposed conditional use is compatible with the character of the existing area because it consists of resiliency improvements accessory to an existing municipal wastewater lift station. The project includes construction of an elevated electrical control platform, permanent emergency generator, access stairs, privacy fence, and associated utility improvements within the public right-of-way immediately adjacent to the existing lift station. The improvements do not expand the lift station service area, increase wastewater capacity, or change the existing municipal utility use.

a. Overall Appearance and Function

The project will not significantly alter the overall appearance or function of the area. The improvements are limited in scale, consolidated adjacent to the existing lift station, and designed to enhance the reliability of an existing public utility. The project preserves the surrounding public right-of-way while improving the City's ability to maintain wastewater service during and after storm events. The elevated controls and generator introduce new vertical utility elements necessary to protect critical equipment from flooding. These improvements are concentrated adjacent to the existing lift station and screened by a six-foot decorative vinyl privacy fence to minimize visual impacts.

b. Historic, Scenic, Archaeological, and Cultural Resources

The proposed improvements are not expected to adversely affect any designated historic, scenic, archaeological, or cultural resources. Construction will comply with all applicable federal, state, and local permitting requirements.

c. Compatibility with Adjacent Development

The project is compatible with adjacent development and is located entirely within public right-of-way. The elevated controls, generator, and associated equipment are located adjacent to the existing lift station to minimize impacts to surrounding properties and infrastructure. A six-foot privacy fence provides visual screening and maintains compatibility with the surrounding streetscape and nearby developments.

d. Livability and Usability

The project will not create significant adverse impacts to nearby properties. The lift station will remain an unmanned municipal utility facility with no increase in staffing, wastewater flows, or daily traffic. Routine generator testing will be conducted in accordance with applicable regulations. The project improves public health and safety by reducing the risk of wastewater service interruptions and sanitary sewer overflows during emergency conditions.

3. Transportation

The existing transportation system is adequate to support the proposed improvements. The project does not increase traffic generation, alter site access, or affect roadway capacity or level of service. Lift Station No. 4 is an unmanned municipal facility that generates only occasional maintenance traffic. Construction traffic will be temporary and managed through an approved maintenance of traffic plan.

4. Parking and Loading

No additional off-street parking or loading areas are required. The lift station will continue to operate as an unmanned municipal utility facility accessed periodically by City personnel for inspection, maintenance, and emergency response. One existing off-street parking space within the public right-of-way will be removed to accommodate the resiliency improvements.

5. Public Health, Safety, and Welfare

The proposed conditional use preserves and promotes the public health, safety, and welfare. Lift Station No. 4 serves the Pass-a-Grille neighborhood south of 22nd Avenue, including Fire Station 22, making its continued operation critical during emergency conditions. The project protects critical electrical and communication systems from flooding, provides permanent emergency backup power, improves operational reliability during utility outages, and reduces the need for temporary bypass pumping and other emergency protective measures. These improvements reduce the potential for sanitary sewer overflows and improve post-storm recovery.

6. Financial and Technical Capacity

The City has demonstrated the financial and technical capacity to complete the proposed improvements. The project was designed by a licensed professional engineering firm, is funded through the City's Capital Improvement Program, and will be constructed under a competitively procured contract approved by the City Commission.

7. Compliance with Applicable Regulations

The proposed conditional use complies with the applicable provisions of the City's Land Development Code governing municipal utility facilities. The project has been designed in accordance with applicable engineering standards and City technical specifications, and all required permits and regulatory approvals will be obtained prior to construction.

Community Redevelopment District Evaluation

1. Utility Infrastructure

The project strengthens the City's wastewater infrastructure by protecting critical electrical and communication systems from flooding, providing permanent emergency backup power, and improving the long-term reliability and resiliency of wastewater service.

2. Transportation Infrastructure

The project maintains existing access from the public right-of-way and does not adversely affect roadway operations, pedestrian circulation, or traffic control. One existing off-street parking space within the public right-of-way will be removed to accommodate the resiliency improvements.

3. Hydrological Features and Stormwater Management

The project improves the resiliency of critical public infrastructure by elevating electrical equipment above the applicable flood elevation, reducing flood vulnerability while maintaining existing drainage patterns.

4. Aesthetic and Architectural Features

The proposed improvements are appropriately scaled for the site and are consolidated adjacent to the existing lift station to minimize visual impacts. Privacy fencing screens the elevated controls and generator from adjacent public spaces and nearby residential properties.

5. Landscaping, Open Space, and Impervious Surface

The project minimizes impacts within the public right-of-way by limiting improvements to the area immediately adjacent to the existing lift station. The City will install and maintain landscaping following construction to enhance compatibility with the surrounding environment.

6. Operational and Functional Requirements

The lift station will continue to operate as an unmanned municipal wastewater facility. The project does not increase operational intensity or change the existing municipal use but substantially improves system reliability during emergency conditions.

7. Fire Suppression and Facility Security

The project enhances public safety by improving wastewater service reliability for the Pass-a-Grille service area, including Fire Station 22. Critical infrastructure will be secured within a fenced enclosure and protected by permanent emergency backup power.

8. Emergency Management and Hurricane Evacuation

The project directly supports the City's emergency management objectives by protecting critical wastewater infrastructure from flooding, maintaining remote monitoring and operational capability during power outages, reducing reliance on temporary emergency equipment, and improving post-storm recovery. These improvements increase the resilience of the wastewater system during hurricanes and other emergency events.

9. Temporary Lodging

Not applicable. The proposed project is an accessory improvement to an existing municipal wastewater lift station and does not involve temporary lodging or residential development.

SITE ADDRESS
(ELECTRICAL BILLING ADDRESS):
00 PASS A GRILLE WAY
ST. PETE BEACH, FL 33706

LIFT STATION 4 INFORMATION EXHIBIT

NEAREST ADDRESS:
1901 PASS A GRILLE WAY
ST. PETE BEACH, FL 33706

WET WELL

WET WELL DEPTH	14 FT
WET WELL DIAMETER	10 FT
APPROX. WET WELL STORAGE*	7,390 GAL

*CALCULATED FROM LOW WATER LEVEL TO TOP OF WET WELL

FORCE MAIN

FORCE MAIN SIZE/MATERIAL	6-IN PVC
BY-PASS PORT SIZE	4-IN CAMLOCK
ARVS TO BE MAINTAINED	0

LIFT STATION PUMPS

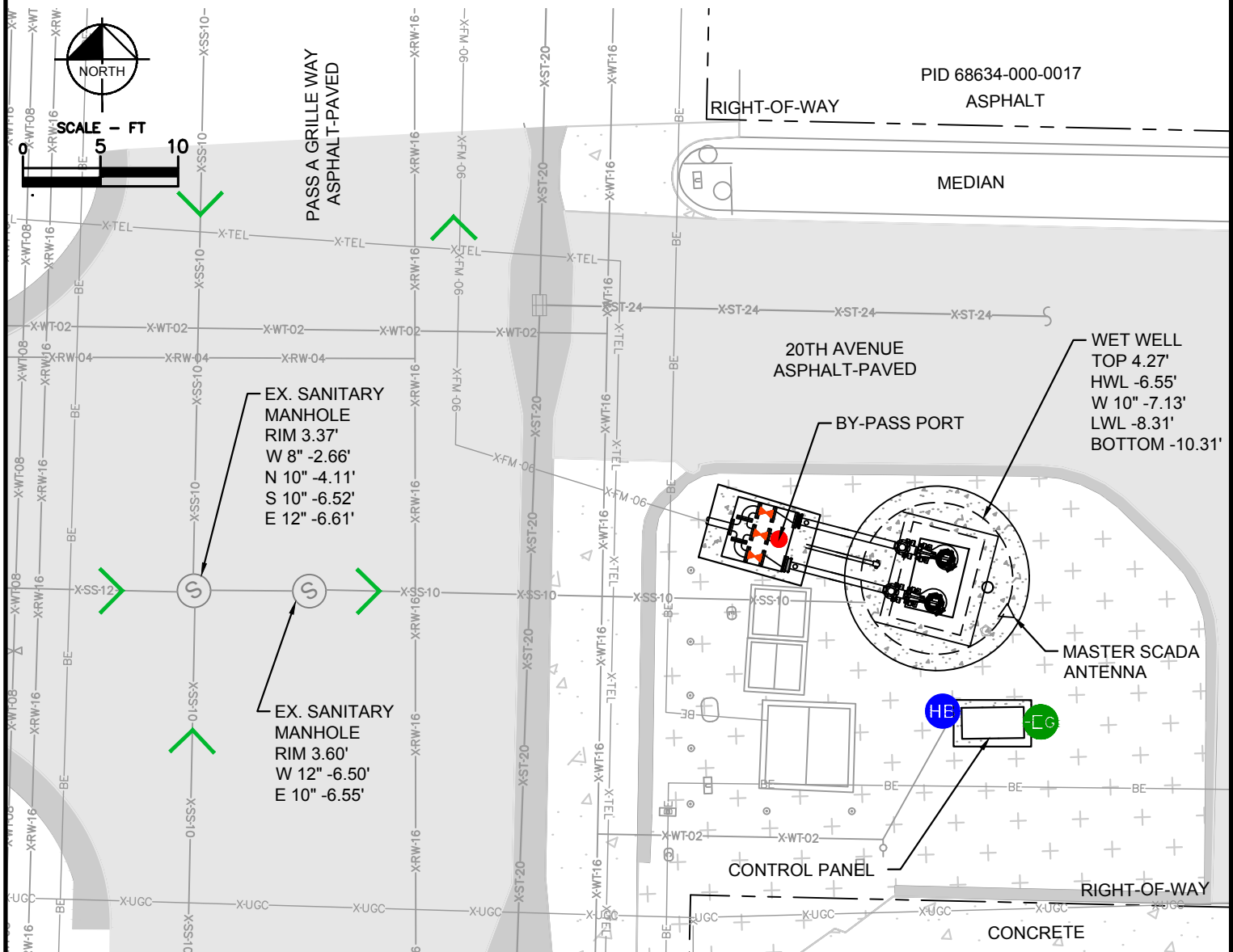
PUMP MODEL & HP	FLYGT NP 3102/5 HP
YEAR OF PUMP INSTALLATION	2021
EST. YEAR OF PUMP OVERHAUL	2031
NUMBER OF PUMPS	2
DESIGN POINT	500 GPM @ 23 FT TDH
IMPELLER DIAMETER	172 MM

PORTABLE GENERATOR - PLUG OUTLET

GENERATOR TYPE	20 kW/ 240 V 3 PH
FUEL TYPE	DIESEL

BY-PASS PUMP REQUIRED

PUMP TYPE	4-IN DIESEL SELF PRIMING PUMP
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LIFT STATION 4 EXHIBIT

FID: LS004



Kimley»Horn

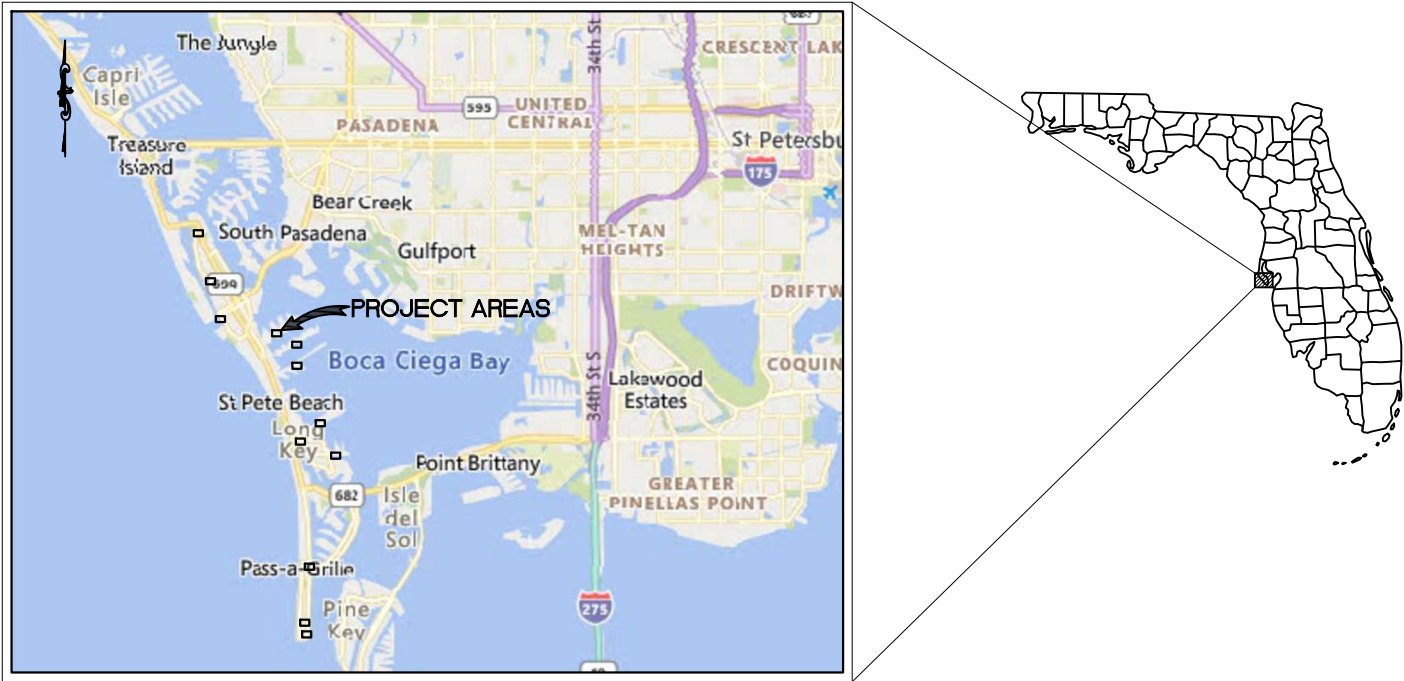
MAY 2021

PUMP AND LIFT STATION REHABILITATIONS

PID# PS26-401-608-00

PREPARED FOR
CITY OF ST. PETE BEACH, FLORIDA
DECEMBER 2025

100% DESIGN PLANS



PROJECT VICINITY MAP

PREPARED BY
Kimley»Horn

© 2025 KIMLEY-HORN AND ASSOCIATES, INC.
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PHONE (727) 547-3099
WWW.KIMLEY-HORN.COM CA 00000896

KYLE T. MATHENY, P.E.
No. 97287

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TECO PEOPLES GAS - ST PETERSBURG
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CLEARWATER, FL 33756
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PINELLAS COUNTY UTILITIES -
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ST PETE BEACH, FL 33706
727.363.9254

UNITI FIBER LLC
CHARLIE CROFT
107 ST FRANCIS ST, SUITE 1800
MOBILE, AL 36602
251.214.7059

GENERAL

1. CONTRACTOR SHALL CONTACT MR. CAMDEN MILLS, (727)-363-9254 TO COORDINATE LIFT STATION SHUT DOWN AND STARTUP.
2. CONTRACTOR MUST MAINTAIN SOUND LEVELS BELOW THE LIMITATIONS SET IN ARTICLE IV SECTION 46-132 OF THE CITY OF ST. PETE BEACH'S CODE OF ORDINANCES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS AND ALL GOVERNING FEDERAL, STATE, AND LOCAL AGENCIES. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS THAT ARE NOT PROVIDED IN THE BID DOCUMENTS, AT NO ADDITIONAL COST TO THE OWNER.
4. THE INFORMATION PROVIDED IN THESE PLANS IS SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF THE CONDITIONS WHICH MAY BE ENCOUNTERED DURING THE COURSE OF WORK. ALL CONTRACTORS ARE DIRECTED, PRIOR TO BIDDING, TO CONDUCT WHATEVER INVESTIGATION THEY MAY DEEM NECESSARY TO ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED, AND UPON WHICH THEIR BIDS WILL BE BASED.
5. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS ON THE PLANS AND REVIEW ALL FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. SHOULD DISCREPANCIES OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO OBTAIN THE ENGINEER'S CLARIFICATION BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER.
6. AT LEAST 2 FULL BUSINESS DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL CONTACT SUNSHINE STATE ONE CALL OF FLORIDA AT 1-800-432-4770 OR THE NATIONAL 811 ONE CALL NUMBER WHEN APPLICABLE FOR UTILITY LOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL UTILITIES FOR THE POSSIBLE RELOCATION OR THE TEMPORARY MOVEMENT OF ANY EXISTING UTILITIES WITHIN THE RIGHTS-OF-WAY.
7. THE CONTRACTOR SHALL INCLUDE IN HIS BID BY-PASS PUMPING FACILITIES, PUMPS, FITTINGS, LABOR, ETC. AS NECESSARY, BASED ON METHOD AND SEQUENCE OF CONSTRUCTION TO COMPLETE ALL WORK WHILE MAINTAINING SEWER SERVICE OPERATIONS AT ALL TIMES.
8. THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER A DETAILED BYPASS PLAN FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
9. THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A DETAILED CONSTRUCTION PHASING PLAN FOR APPROVAL, PRIOR TO BEGINNING CONSTRUCTION.
10. THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER A DETAILED HURRICANE PREPAREDNESS PLAN FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
11. THE CONTRACTOR SHALL FURNISH SHOP DRAWINGS TO THE ENGINEER FOR REVIEW OF ALL PIPE CONNECTIONS, TRANSITIONS, AND SPECIAL APPURTENANCES PRIOR TO FABRICATION OR DELIVERY TO THE JOB SITE.

SAFETY

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE FLORIDA TRENCH SAFETY ACT, 90-96, LAWS OF FLORIDA EFFECTIVE OCTOBER 1, 1990 AND THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION EXCAVATION SAFETY STANDARDS, 29 CFR 1926.650, SUBPART P, AS AMENDED. THE CONTRACTOR SHALL INCLUDE IN THE TOTAL BID PRICE ALL COSTS FOR COMPLIANCE WITH THESE REGULATIONS.
2. THE CONTRACTOR SHALL USE SHEET PILING, SHEETING, BRACING, ETC., AS REQUIRED IN ALL EXCAVATION AREAS AND CONFORM TO ALL OSHA REQUIREMENTS.
3. THE CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND UTILITIES, POWER LINES, ETC.
4. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THIS EXCLUSION DOES NOT ALLEVIATE THE CONTRACTOR FOR PROVIDING A CONTINUOUS SAFE WORKSPACE.

ENVIRONMENTAL

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY STORM WATER, EROSION, AND SEDIMENTATION CONTROL MEASURES IN ACCORDANCE WITH THE FDOT "FLORIDA STORM WATER, EROSION AND SEDIMENTATION CONTROL INSPECTOR'S MANUAL". IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTROL AND PREVENT EROSION AND TRANSPORT OF SEDIMENT TO SURFACE DRAINS AND TO DITCHES DURING CONSTRUCTION.
2. STOCKPILES SHALL BE PROTECTED AT ALL TIMES BY ON-SITE DRAINAGE CONTROLS WHICH PREVENT EROSION OF THE STOCKPILED MATERIAL. CONTROL OF DUST FROM SUCH STOCKPILES IS REQUIRED, DEPENDING UPON THEIR LOCATION AND THE EXPECTED LENGTH OF TIME THE STOCKPILES WILL BE PRESENT. IN NO CASE SHALL ANY STOCKPILED MATERIAL REMAIN AFTER THIRTY (30) CALENDAR DAYS.
3. STORM WATER INLETS IN THE VICINITY OF THE PROJECT SHALL BE PROTECTED BY SEDIMENT TRAPS SUCH AS SECURED HAY BALES, SOD, STONE, ETC., WHICH SHALL BE MAINTAINED AND MODIFIED AS REQUIRED BY CONSTRUCTION PROGRESS, AND WHICH MUST BE APPROVED BY THE ENGINEER BEFORE INSTALLATION. THIS WILL BE MAINTAINED TO PREVENT DEGRADATION OF THE WATERS OF THE COUNTY AND STATE.
4. SEDIMENT BASINS AND TRAPS, PERIMETER BERMS, SEDIMENT BARRIERS, VEGETATIVE BUFFERS, AND OTHER MEASURES INTENDED TO TRAP SEDIMENT AND/OR PREVENT THE TRANSPORT OF SEDIMENT ONTO ADJACENT PROPERTIES, OR INTO EXISTING BODIES OF WATER, MUST BE INSTALLED, CONSTRUCTED, OR IN THE CASE OF VEGETATIVE BUFFERS, PROTECTED FROM DISTURBANCE, AS A FIRST STEP IN THE LAND ALTERATION PROCESS. SUCH SYSTEMS SHALL BE FULLY OPERATIVE BEFORE ANY OTHER DISTURBANCE OF THE SITE BEGINS. EARTHEN STRUCTURES INCLUDING BUT NOT LIMITED TO BERMS, EARTH FILTERS, DAMS OR DIKES SHALL BE STABILIZED AND PROTECTED FROM DRAINAGE DAMAGE OR EROSION WITHIN ONE (1) WEEK OF INSTALLATION.
5. ALL SWALES, DITCHES, AND CHANNELS LEADING FROM THE SITE SHALL BE PROTECTED FROM SILTATION AND EROSION DURING CONSTRUCTION AND BE SODDED WITHIN THREE (3) DAYS OF EXCAVATION.
6. SOIL DISPLACED BY CONSTRUCTION WILL BE REMOVED. EROSION CONTROL SHALL BE IMPLEMENTED IN AREAS WHICH ARE CONSIDERED ENVIRONMENTALLY SENSITIVE. EROSION CONTROL SYSTEMS SHALL BE REQUIRED FOR ALL WORK WITHIN JURISDICTIONAL AREAS. THESE SYSTEMS MAY INCLUDE STAKED HAY BALES, SILT SCREENS, FILTER FABRIC, AND TURBIDITY SCREENS.
7. ALL EROSION AND POLLUTION CONTROL DEVICES SHALL BE CHECKED REGULARLY, ESPECIALLY AFTER EACH RAINFALL AND SHALL BE CLEANED OUT AND/OR REPAIRED AS REQUIRED.
8. THE CONTRACTOR SHALL NOT ENTER UPON OR IN ANY WAY ALTER WETLAND AREAS THAT MAY BE ON OR NEAR THE CONSTRUCTION SITE. ALL WORK IN THE VICINITY OF OPEN WATER AND/OR WETLANDS IS TO BE PERFORMED IN COMPLIANCE WITH THE ENVIRONMENTAL REGULATIONS AND/OR PERMITS FOR THE SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY FINES RESULTING FROM HIS VIOLATION OF ANY REGULATIONS OR PERMIT CONDITIONS.
9. CONTRACTOR SHALL PROVIDE PROTECTIVE MATTING, FUEL CONTAINMENT AND ALL OTHER MATERIALS, EQUIPMENT AND LABOR TO PROTECT THE STAGING AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL, PRIOR TO BEGINNING CONSTRUCTION, SUBMIT A "FUELING SPILL PREVENTION PLAN" THAT SHALL CLEARLY INDICATE HOW FUEL SPILLS WILL BE PREVENTED WHEN FUELING BOTH WITHIN AND OUTSIDE OF THE STAGING AREA.

RIGHT-OF-WAY

1. ALL CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO WITHIN THE CITY OF ST. PETE BEACH RIGHT-OF-WAY AND/OR EASEMENTS SHOWN ON THE DRAWINGS.
2. THE CONTRACTOR SHALL EMPLOY A LAND SURVEYOR REGISTERED IN THE STATE OF FLORIDA TO REFERENCE AND RESTORE PROPERTY CORNER MONUMENTS, PINS, AND LANDMARKS THAT MAY BE DISTURBED BY CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR, PRIOR TO CONSTRUCTION AND RESTRICTING ANY TRAFFIC, MUST OBTAIN A RIGHTS-OF-WAY USE PERMIT AND A TRAFFIC CONTROL PLAN. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM OTHER GOVERNMENTAL AGENCIES HAVING RELEVANT JURISDICTION. ALL MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE CURRENT FLORIDA DEPARTMENT OF TRANSPORTATION "MANUAL OF TRAFFIC CONTROL AND SAFE PRACTICES". A TRAFFIC CONTROL PLAN SHALL BE SUPPLIED BY THE CONTRACTOR AT THE PRE-CONSTRUCTION MEETING.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL DAMAGED STORM WATER STRUCTURES, PIPING, ENTRANCE PIPE AND HEADWALLS WHETHER SHOWN ON THE PLANS OR NOT. THE HEADWALLS SHALL BE REPLACED IN ACCORDANCE WITH F.D.O.T. STANDARDS.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH IN THE FIELD THE RIGHT-OF-WAY LINES, BASE LINES, BENCH MARKS (ELEV.), CENTER LINES, AND STATIONING AS REQUIRED TO CONSTRUCT THIS PROJECT.
6. THE CONTRACTOR SHALL COORDINATE THE CUTTING OF DRIVEWAYS WITH THE PROPERTY OWNER PRIOR TO CUT. ALL DRIVEWAYS WILL BE IN PASSABLE CONDITION AT THE END OF THE WORK DAY AND FULLY RESTORED.
7. A RIGHT OF ENTRY AGREEMENT SHALL BE OBTAINED BY THE PROJECT MANAGER FROM THE PROPERTY OWNER BEFORE ANY DRIVEWAY CONSTRUCTION WORK IS DONE OUTSIDE OF THE RIGHT-OF-WAY OR EASEMENT.

UTILITIES

1. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA AND WHICH HAVE NOT BEEN LOCATED OR IDENTIFIED. MAY NOT BE IN THE EXACT LOCATION SHOWN OR RELOCATED SINCE THE PREPARATION OF THESE PLANS. THE CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS AND DIMENSIONS OF ALL EXISTING UTILITIES STRUCTURES AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE PLANS) THAT MAY EFFECT HIS WORK. ALL EXISTING UTILITIES TO BE EXTENDED, CROSSED OR CONNECTION POINTS SHALL BE EXPOSED PRIOR TO CONSTRUCTION TO VERIFY LOCATION AND ELEVATION. ANY DISCREPANCIES OR CONFLICTS FOUND SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION FOR RESOLUTION.
2. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, WATER AND SEWER LINES, STORM DRAINS, UTILITIES, DRIVEWAYS, SIDEWALKS, SIGNS, MAIL BOXES, FENCES, TREES, LANDSCAPING, AND ANY OTHER IMPROVEMENT OR FACILITY IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY DAMAGED ITEM DUE TO HIS CONSTRUCTION ACTIVITIES TO EQUAL OR BETTER THAN PRE-CONSTRUCTION CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL USE APPROPRIATE TECHNIQUES, AS APPROVED, RECOMMENDED OR OFFERED BY DUKE ENERGY TO PREVENT UNDERMINING OF POWER POLES DURING CONSTRUCTION. IF HOLDING OF POWER POLES IS RECOMMENDED OR REQUIRED BY THE UTILITY, THE CONTRACTOR SHALL COORDINATE THIS ACTIVITY WITH THE UTILITY AND BEAR ALL RELATED COSTS.
4. ANY TEMPORARY SHUTDOWNS FOR MODIFICATIONS OF EXISTING UTILITY SYSTEMS THAT MUST REMAIN IN SERVICE DURING CONSTRUCTION SHALL BE KEPT TO A MINIMUM AND SHALL BE COORDINATED WITH AND APPROVED BY THE CITY OF ST. PETE BEACH UTILITY OPERATIONS DEPARTMENT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT IS NOTED THAT TEMPORARY SHUTDOWNS MAY BE RESTRICTED TO CERTAIN HOURS AT ANY TIME OF THE DAY OR NIGHT AND WILL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.
5. FOR WORK BEING DONE ON EXISTING SANITARY SEWER LINES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE FLOW OF ALL SEWAGE DURING CONSTRUCTION, WHICH MAY REQUIRE BY-PASS PUMPING AND/OR PUMPER TRUCKS. THE CONTRACTOR SHALL SUBMIT A DETAILED BY-PASS PUMPING PLAN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE JURISDICTIONAL BODIES AND UTILITY COMPANIES LISTED ON THE COVER SHEET OF THIS PLAN SET.

RESTORATION

1. ALL RESTORATION WORK PERFORMED THROUGHOUT THE PROJECT SHALL CONFORM TO EXISTING LINES AND GRADES UNLESS SHOWN OTHERWISE.
2. ALL DISTURBED GRASSED AREAS SHALL BE SODDED OR SEEDED UNLESS OTHERWISE INDICATED. THE TYPE OF SOD USED TO REPLACE OWNER MAINTAINED AREAS IN RIGHT-OF-WAY SHALL BE COORDINATED WITH THE PROPERTY OWNER.
3. ALL CONCRETE THRUST BLOCKS INSTALLED FOR TESTING PURPOSES AND NOT REQUIRED FOR THE OPERATION OF THE PIPELINE SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE, AT NO ADDITIONAL COST TO THE OWNER.
4. ASPHALT DRIVES THAT ARE CUT SHALL BE RESTORED PER SPECIFICATIONS AND/OR DETAILS.
5. WHENEVER A PERMANENT ROADWAY SURFACE IS NOT PLACED IMMEDIATELY AFTER BACKFILLING AND COMPACTION OF THE NEWLY INSTALLED PIPE LINE IN AREAS WHERE TRAFFIC MUST PASS, THE CONTRACTOR SHALL INSTALL A TEMPORARY SURFACE CONSISTING OF NINE INCHES OF COMPACTED LIME ROCK BASE AND A COAT OF ASPHALT EMULSION. PERMANENT ROADWAY REPAIR SHALL BE PERFORMED A MAXIMUM OF TWENTY-ONE CALENDAR DAYS AFTER THE INITIAL OPEN CUTTING.
6. RESTORATION OF CURBS, DRIVEWAYS, SIDEWALKS, AND PLACEMENT OF SOD SHALL BE COMPLETED WITHIN FORTY-FIVE CALENDAR DAYS OF INITIAL DISTURBANCE, OR TWENTY-ONE CALENDAR DAYS OF SUBSTANTIAL COMPLETION, WHICHEVER OCCURS FIRST.
7. ALL EXISTING FENCES DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED AND REINSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER UNLESS SHOWN TO BE REMOVED ON CONSTRUCTION PLANS.

CONSTRUCTION

1. THE EXHAUST SYSTEM OF ALL GASOLINE AND DIESEL ENGINES SHALL BE EQUIPPED WITH MUFFLERS THAT MEET THE EQUIPMENT MANUFACTURER'S REQUIREMENTS FOR NOISE SUPPRESSION. THE CONTRACTOR SHALL INSTALL NOISE ABATEMENT Baffles POSITIONED TO BREAK LINE-OF-SITE FROM THE NOISE SOURCE TO AFFECTED RESIDENCES, AS APPROVED BY THE ENGINEER.
2. NO MATERIAL SHALL BE STOCKPILED IN ROADWAYS. ALL DIRT AND DEBRIS SHALL BE REMOVED FROM THE JOB SITE DAILY. ROADS SHALL BE SWEEPED DAILY AS PART OF DAILY CLEAN UP.
3. THE CONTRACTOR IS TO CONTROL ALL FUGITIVE DUST ORIGINATING ON THIS PROJECT BY WATERING OR OTHER METHODS AS REQUIRED.
4. INGRESS AND EGRESS TO ALL THE PROPERTIES IN THE CONSTRUCTION AREA SHALL BE MAINTAINED AT ALL TIMES.
5. PRIOR APPROVAL WILL BE REQUIRED FOR REMOVAL OF ANY TREE WITHIN THE CONSTRUCTION AREA.
6. THE CONTRACTOR SHALL PROVIDE ALL DEWATERING EQUIPMENT NECESSARY TO KEEP ALL EXCAVATIONS DRY. DEWATERING IS REQUIRED TO 18" BELOW TRENCH BOTTOM.
7. ALL PIPING AND FITTINGS USED ON THIS PROJECT SHALL BE AS NOTED ON THE PLANS AND IN THE CONTRACT DOCUMENT AND SHALL BE INSTALLED TO THE LINES AND GRADES SHOWN ON THE PLANS AND PROFILES.
8. ALL PIPE AND FITTINGS SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER AND ALL PIPE JOINTS SHALL BE RESTRAINED.
9. ALL FITTINGS FOR PRESSURE CLASS-RATED PIPE SHALL BE RESTRAINED DUCTILE IRON & POLY WRAPPED. RESTRAINED LENGTHS OF PIPE SHALL ADHERE TO THE REQUIREMENTS AS SHOWN ON THE DETAIL SHEETS.
10. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE DEFLECTION SHALL NOT EXCEED 75% OF THE MANUFACTURER'S MAXIMUM ALLOWABLE RECOMMENDED DEFLECTION.
11. ALL ROCKS OR STONES LARGER THAN SIX INCH DIAMETER SHALL BE REMOVED FROM THE BACKFILL MATERIAL. BACKFILL MATERIAL PLACED WITHIN ONE FOOT OF PIPING AND APPURTENANCES SHALL NOT CONTAIN ANY STONES LARGER THAN TWO INCH DIAMETER.
12. ALL NEW PIPE LINES SHALL BE PIG CLEANED (4" AND LARGER), FLUSHED, PRESSURE TESTED AND CERTIFIED PRIOR TO TIE-INS TO EXISTING FACILITIES. THE CONTRACTOR WILL BE ALLOWED TO USE TEMPORARY PLUGS FOR PIG CLEANING AND PRESSURE TESTING.
13. ALL TEST POINT PIPING SHALL BE CUT LOOSE FROM THE CORPORATION STOP AND COMPLETELY REMOVED AND DISPOSED OF BY THE CONTRACTOR PRIOR TO FINAL ACCEPTANCE. A CORPORATION STOP PLUG SHALL BE INSTALLED AND THE CORPORATION STOP SHALL REMAIN IN PLACE.
14. ALL EXISTING MAINS THAT ARE BEING REPLACED SHALL BE ABANDONED IN PLACE UPON ACCEPTANCE AND ACTIVATION OF THE NEW MAINS. ABANDONED MAINS SHALL BE CUT, FILLED WITH GROUT, AND CAPPED.
15. FIELD CONDITIONS MAY NECESSITATE MINOR ALIGNMENT AND GRADE DEVIATION OF THE PROPOSED UTILITIES TO AVOID OBSTACLES, AS ORDERED BY THE ENGINEER.

TRAFFIC CONTROL NOTES

1. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH FDOT STANDARD PLANS INDEX 102 FOR MAINTENANCE OF TRAFFIC. DEVIATIONS FROM THE FDOT STANDARD PLANS INDEX REQUIRE A SIGNED AND SEALED MOT PLAN BE PROVIDED BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION.
2. CONTRACTOR TO COORDINATE MOT FOR ALL CONCURRENT PROJECTS IN CONSTRUCTION WITHIN THE PROJECT AREA TO ENSURE CONFLICTS BETWEEN OVERLAPPING MOT PLANS DO NOT OCCUR.
3. CONTRACTOR TO COORDINATE WITH PINELLAS COUNTY SHERIFFS OFFICE TO REDUCE UNLAWFUL USE OF ROADWAY DURING CONSTRUCTION.
4. ALL EXISTING PAVEMENT MARKINGS OUTSIDE THE CONSTRUCTION LIMITS THAT HAVE BEEN ALTERED BECAUSE OF CONSTRUCTION OPERATIONS SHALL BE REPLACED UPON THE COMPLETION OF THE PROJECT AT THE CONTRACTORS EXPENSE.
5. PEDESTRIANS, BICYCLES, AND WHEELCHAIRS: AT THE END OF EACH WORKDAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE, ANY DROP-OFF ADJACENT TO A SIDEWALK SHALL BE BACKFILLED AT A SLOPE NOT TO EXCEED 1:4, OR SHALL BE PROTECTED IN ACCORDANCE WITH STANDARD PLANS INDEX 102 FOR MAINTENANCE OF TRAFFIC.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMMEDIATE REMOVAL OF STORMWATER FROM THE ROADWAYS UTILIZED FOR TRAFFIC CONTROL IN A MANNER APPROVED BY THE ENGINEER.
7. ONE PORTABLE VARIABLE MESSAGE SIGN SHALL BE USED IN ADVANCE OF EACH LANE CLOSURE. THE FOLLOWING ARE SUGGESTED MESSAGES TO USE IN THE APPROPRIATE SITUATIONS.
MESSAGE 1
"RIGHT" OR "CENTER" OR "LEFT"
"LANE" OR "LANE" OR "LANE"
"CLOSED" OR "CLOSED" OR "CLOSED"
8. AT THE END OF EACH WORKING DAY'S ACTIVITY, TEMPORARY PAVEMENT MARKINGS AND TEMPORARY RPMs SHALL BE INSTALLED PRIOR TO OPENING THE LANES UP FOR TRAFFIC.
9. ALL PAVEMENT MARKINGS, SIGNS, MARKERS, CHANNELIZATION REQUIRED TO PHASE WORK OR SHIFT TRAFFIC, SHALL UTILIZE STANDARD PLAN INDICES FOR PLACEMENT.
10. THE CONTRACTOR SHALL RESTRICT THE OPERATIONS SO THAT THE FIRST LIFT OF ASPHALT IS PLACED ON THE SAME DAY THAT THE LANES ARE MILLED, BEFORE OPENING THE LANES TO TRAFFIC. INSTALL TEMPORARY PAVEMENT MARKINGS AFTER THE FIRST LIFT AND PRIOR TO OPENING.
11. THE CONTRACTOR IS RESPONSIBLE TO RETIME THE TRAFFIC SIGNALS WITHIN THE PROJECT LIMITS (INCLUDING LIMITS OF WORK ZONE TRAFFIC CONTROL) THAT ARE POTENTIALLY AFFECTED DURING VARIOUS PHASES OF CONSTRUCTION.

LEGEND

RIGHT-OF-WAY	
EXISTING 4" FORCE MAIN	
EXISTING 6" FORCE MAIN	
EXISTING 8" FORCE MAIN	
EXISTING 8" SANITARY SEWER	
EXISTING 10" SANITARY SEWER	
EXISTING 12" STORM	
EXISTING 15" STORM	
EXISTING 18" STORM	
EXISTING 24" STORM	
EXISTING 30" STORM	
EXISTING 36" STORM	
EXISTING RECLAIMED MAIN	
EXISTING 4" RECLAIMED MAIN	
EXISTING 16" RECLAIMED MAIN	
EXISTING WATER MAIN	
EXISTING 2" WATER MAIN	
EXISTING 16" WATER MAIN	
EXISTING OVERHEAD COMMUNICATIONS	
EXISTING OVERHEAD ELECTRIC	
EXISTING GAS MAIN	
EXISTING BURIED TELEPHONE	
EXISTING BURIED COMMUNICATIONS	
EXISTING BURIED ELECTRIC	
PROPOSED 6" VINYL FENCING	
PROPOSED 2" RECLAIMED MAIN (OPEN CUT)	
PROPOSED 2" WATER MAIN (OPEN CUT)	
EXISTING STORM MANHOLE	
EXISTING SANITARY SEWER MANHOLE	
PROPOSED AIR RELEASE VALVE ASSEMBLY (ARV)	
PROPOSED ELECTRICAL EQUIPMENT RACK	
PROPOSED CONCRETE	
TO BE DEMOLISHED	

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
G-01	COVER SHEET
G-02	CIVIL GENERAL NOTES
G-03	KEY SHEET
C-01	LIFT STATION 4 REHABILITATION SITE PLAN
C-02	LIFT STATION 5 REHABILITATION SITE PLAN
C-03	LIFT STATION 9 REHABILITATION SITE PLAN
C-04	LIFT STATION 10 REHABILITATION SITE PLAN
C-05	LIFT STATION 11 REHABILITATION SITE PLAN
C-06	LIFT STATION 12 REHABILITATION SITE PLAN
C-07	LIFT STATION 13 REHABILITATION SITE PLAN
C-08	LIFT STATION 14 REHABILITATION SITE PLAN
C-09	LIFT STATION 15 REHABILITATION SITE PLAN
C-10	STORMWATER LIFT STATION 35 REHABILITATION SITE PLAN
D-01	CIVIL DETAILS
D-02	CIVIL DETAILS
S-0.1	STRUCTURAL GENERAL NOTES
S-0.2	STRUCTURAL GENERAL NOTES
S-1.0	ELEVATED GENERATOR PLATFORM DETAILS
S-1.1	ELEVATED GENERATOR PLATFORM DETAILS
S-1.2	STRUCTURAL - STAIR DETAILS
E-01	ELECTRICAL LEGEND
E-02	LIFT STATION 4 REHABILITATION ELECTRICAL SITE PLAN
E-03	LIFT STATION 4 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-04	LIFT STATION 5 REHABILITATION ELECTRICAL SITE PLAN
E-05	LIFT STATION 5 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-06	LIFT STATION 9 REHABILITATION ELECTRICAL SITE PLAN
E-07	LIFT STATION 9 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-08	LIFT STATION 10 REHABILITATION ELECTRICAL SITE PLAN
E-09	LIFT STATION 10 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-10	LIFT STATION 11 REHABILITATION ELECTRICAL SITE PLAN
E-11	LIFT STATION 11 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
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E-14	LIFT STATION 13 REHABILITATION ELECTRICAL SITE PLAN
E-15	LIFT STATION 13 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-16	LIFT STATION 14 REHABILITATION ELECTRICAL SITE PLAN
E-17	LIFT STATION 14 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-18	LIFT STATION 15 REHABILITATION ELECTRICAL SITE PLAN
E-19	LIFT STATION 15 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-20	STORMWATER LS 35 REHABILITATION ELECTRICAL SITE PLAN
E-21	STORMWATER LS 35 REHABILITATION ELECTRICAL ONE-LINE DIAGRAM
E-22	ELECTRICAL EQUIPMENT RACK - ATL
E-23	ELEVATED ELECTRICAL EQUIPMENT RACK - ATL
E-24	ELEVATED ELECTRICAL EQUIPMENT RACK - VFD
E-25	ELECTRICAL EQUIPMENT RACK - RVSS
E-26	PUMP CONTROL PANEL LAYOUT - ATL
E-27	PUMP CONTROL PANEL WIRING DIAGRAM - ATL
E-28	PUMP CONTROL PANEL WIRING DIAGRAM - ATL
E-29	PUMP CONTROL PANEL WIRING DIAGRAM - ATL
E-30	PUMP CONTROL PANEL LAYOUT - VFD
E-31	PUMP CONTROL PANEL WIRING DIAGRAM - VFD
E-32	PUMP CONTROL PANEL WIRING DIAGRAM - VFD
E-33	PUMP CONTROL PANEL WIRING DIAGRAM - VFD
E-34	PUMP CONTROL PANEL WIRING DIAGRAM - VFD
E-35	PUMP CONTROL PANEL LAYOUT - RVSS
E-36	PUMP CONTROL PANEL WIRING DIAGRAM - RVSS
E-37	PUMP CONTROL PANEL WIRING DIAGRAM - RVSS
E-38	PUMP CONTROL PANEL WIRING DIAGRAM - RVSS
E-39	PUMP CONTROL PANEL WIRING DIAGRAM - RVSS
E-40	ELECTRICAL DETAILS
E-41	ELECTRICAL DETAILS

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WWW.KIMLEY-HORN.COM

DESIGN ENGINEER:

KYLE T. MATTHEW, P.E.
FL LICENSE NUMBER
97287

SCALE:

AS NOTED

DESIGN:

KTM

DRAWN:

JTS

CHECKED:

SNH

CIVIL GENERAL NOTES

CITY OF ST. PETE BEACH
PUMP & LIFT STATION
REHABILITATIONS
PID# PS26-401-608-00

FLORIDA

PINELLAS COUNTY

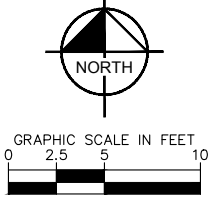
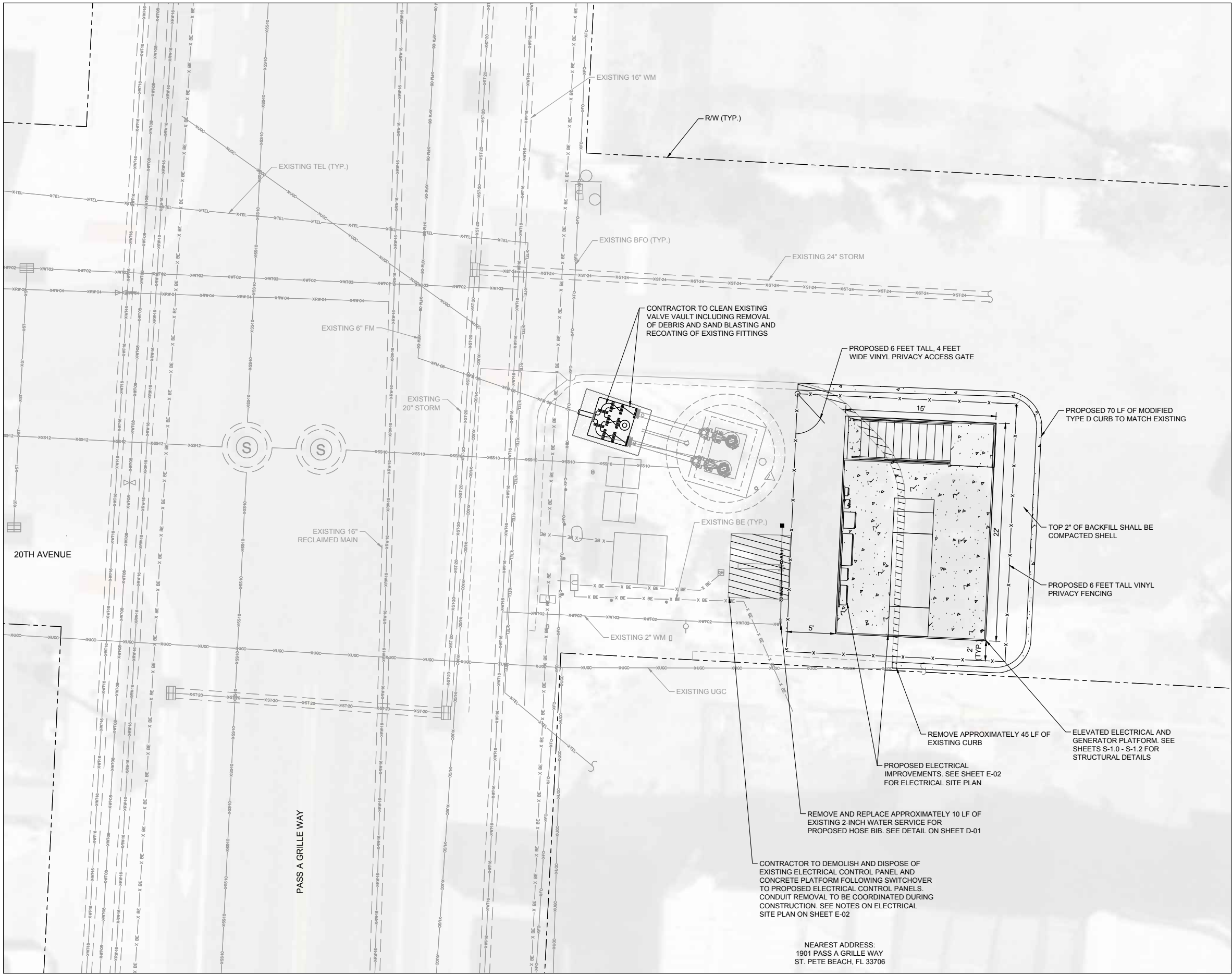
DATE:
NOVEMBER 2025

PROJECT NO.
148404108

SHEET NUMBER
G-02

GROUNDWATER / DEWATERING NOTE:
THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.





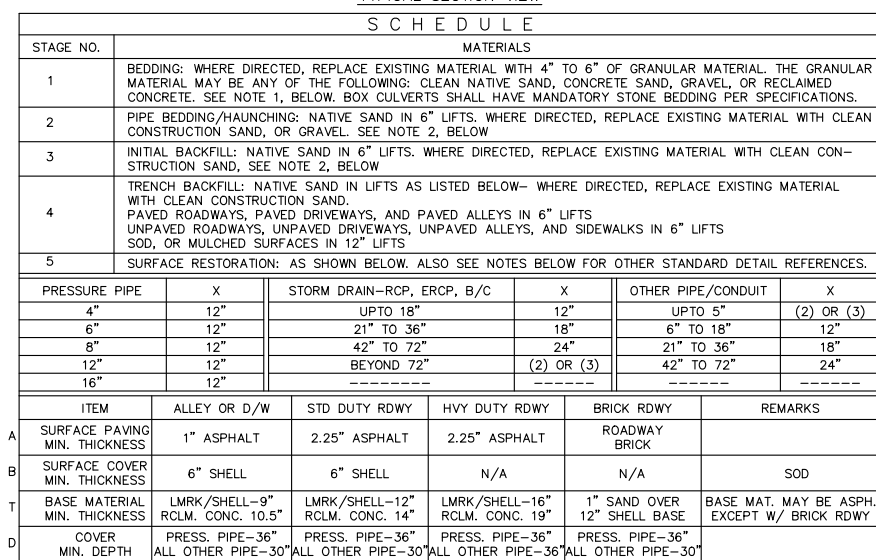
- GENERAL NOTES:
1. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION AND ORDERING EQUIPMENT. CONTRACTOR SHALL NOTIFY ENGINEER OF DISCREPANCIES
 2. CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING EQUIPMENT, UTILITIES, STRUCTURES, AND PERSONNEL FROM DAMAGE OR INJURY DURING CONSTRUCTION. CONSTRUCTION SEQUENCE SHALL BE COORDINATED TO AVOID ANY FLOW INTERRUPTIONS.
 3. ALL EXISTING MECHANICAL PIPING AND EQUIPMENT REMOVED SHALL BE SALVAGED PER SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF DEMOLISHED MATERIAL. DISPOSAL SHALL BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS
 4. PRESSURE WASHING AND CLEANING OF EXISTING WET WELL SHALL BE COMPLETED FOLLOWING EQUIPMENT REMOVAL AND BYPASSING OF THE LIFT STATION.
 5. BYPASSING WILL BE REQUIRED FOR CONSTRUCTION. CONTRACTOR TO SUBMIT BY PASSING PLAN PRIOR TO BEGINNING CONSTRUCTION.
 6. CONTRACTOR TO CLEAR AND GRUB AS NECESSARY FOR PROPOSED IMPROVEMENTS INCLUDING ELEVATED PLATFORM, SITE FENCING, AND PIPING/CONDUIT INSTALLATION
 7. CONTRACTOR TO VERIFY SIZES PRIOR TO ORDERING MATERIALS

- LEGEND
- R/W _____
- PROPOSED 6" VINYL FENCING _____
- PROPOSED 2" RECLAIMED MAIN (OPEN CUT) _____
- PROPOSED AIR RELEASE VALVE ASSEMBLY (ARV) _____
- PROPOSED CONCRETE TO BE DEMOLISHED _____

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		DESIGN ENGINEER: KYLE T. MATHENY, P.E. FL LICENSE NUMBER 97287		DATE: DECEMBER 2025	
PROJECT NO. 148404108		SCALE: AS NOTED		PROJECT NO. 148404108	
SHEET NUMBER C-01		DESIGN: KTM		SHEET NUMBER C-01	
DRAWN: JTS		CHECKED: SNH		DRAWN: JTS	
PINELLAS COUNTY		FLORIDA		DRAWN: JTS	
811 Call Before You Dig www.callbeforeyoudig.com		Kimley»Horn © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM		Revisions No. Date By	

GROUNDWATER / DEWATERING NOTE:
THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.





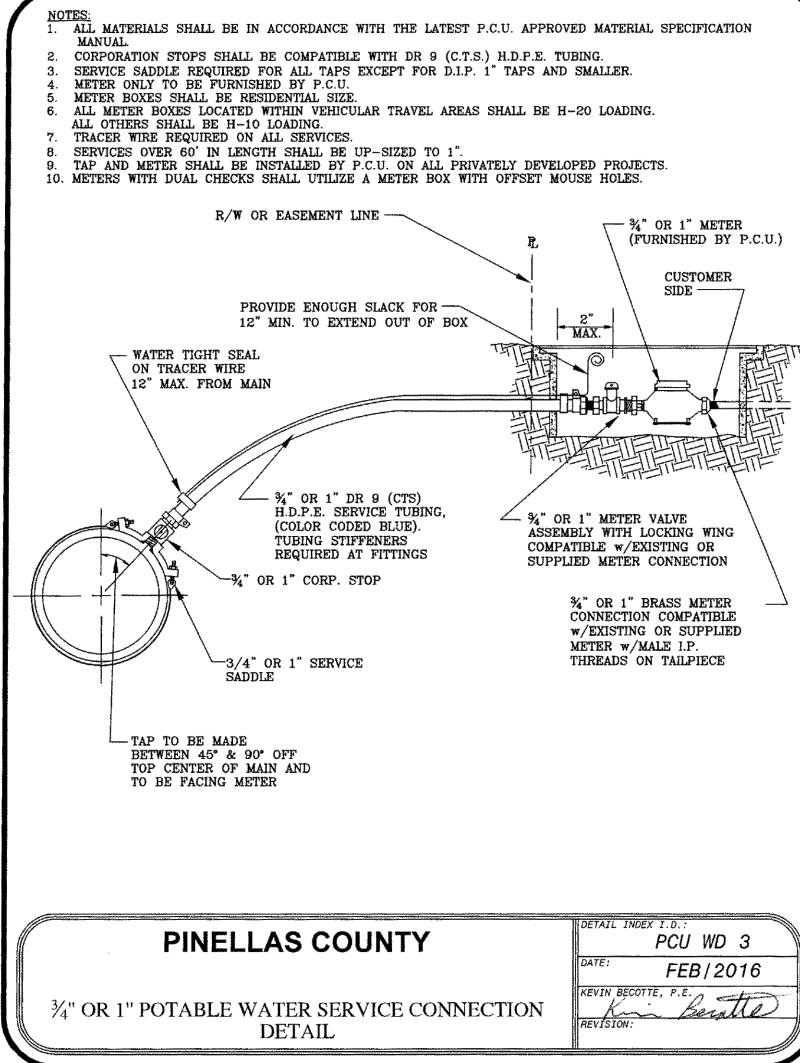
PIPE BEDDING DETAIL

N.T.S.

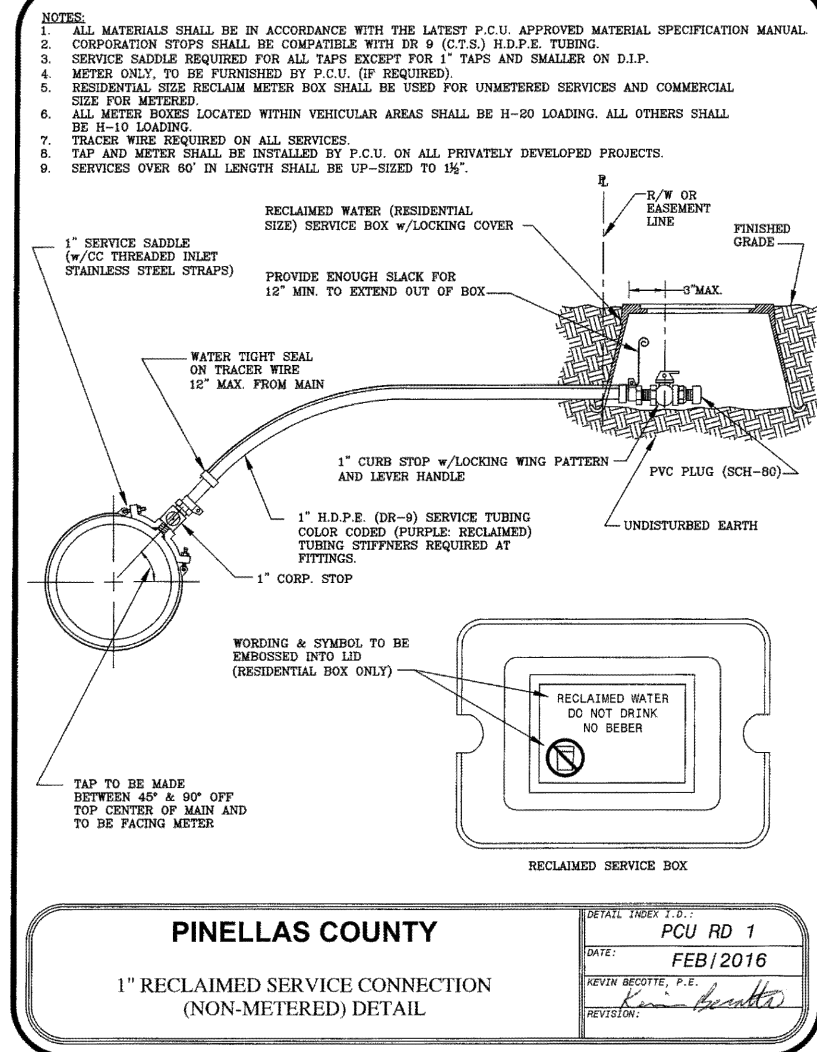
1
D-01

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

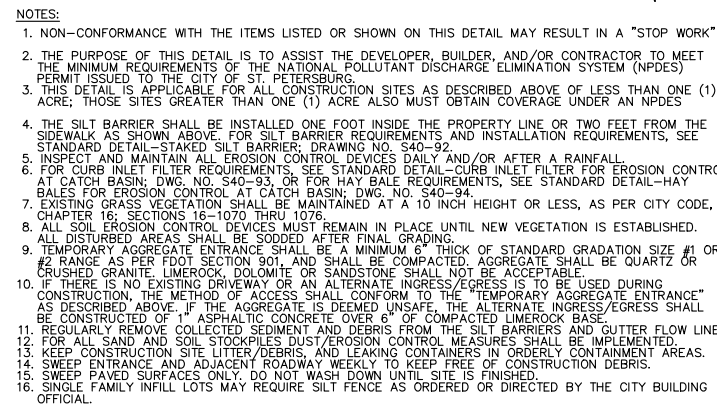
F.A.C. RULE 62-555.314
N.T.S.



N.T.S. D-01

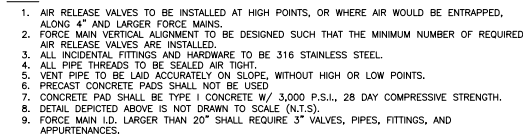


NTS P-01



N.T.S. (D-6)

[illegible]



1 OF 1

1. THESE NOTES ARE NOT INTENDED TO REPLACE THE PROJECT SPECIFICATIONS OR CONSTRUCTION DRAWING NOTES & DETAILS. IN CASE OF CONFLICT BETWEEN THE REQUIREMENTS OF THE SPECIFICATIONS/CONSTRUCTION DRAWINGS AND THESE NOTES, THE MORE STRINGENT REQUIREMENT SHALL APPLY.
2. THE GOVERNING CODE FOR THIS PROJECT IS THE FLORIDA BUILDING CODE, EIGHTH EDITION (2023).
3. THE CONTRACT DOCUMENTS HAVE MADE NO INTENT TO GIVE SPECIFIC INSTRUCTIONS CONCERNING THE MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES AND ASSIGNMENT OF WORK.
4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SUPERVISING AND DIRECTING THE WORK. TO THE BEST OF OUR KNOWLEDGE, THE DRAWINGS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE GOVERNING BUILDING CODE.
5. CONSTRUCTION SHALL COMPLY WITH REQUIREMENTS OF THE GOVERNING BUILDING CODE AND ALL OTHER APPLICABLE FEDERAL, STATE AND LOCAL CODES, STANDARDS, REGULATIONS AND LAWS.
6. THE STRUCTURAL DRAWINGS ARE TO BE USED IN CONJUNCTION WITH THOSE OF THE OTHER TRADES. IF A CONFLICT EXISTS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.
7. CONTRACTOR SHALL VISIT EACH SITE AND BE FAMILIAR WITH THE PROPOSED WORK, TAKE FIELD MEASUREMENTS AND VERIFY ALL FIELD CONDITIONS, AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
8. CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS, DIMENSIONS AND SITE CONDITIONS AND COORDINATE WITH FIELD DIMENSIONS AND PROJECT SHOP DRAWINGS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS GIVEN ON STRUCTURAL DRAWINGS RELATING TO GRID LINES, COLUMN AND WALL LOCATIONS, STRUCTURAL AND FINISHED FLOOR ELEVATIONS, MEMBER SIZES, ETC, WITH THE DRAWINGS OF OTHER TRADES BEFORE STARTING ANY WORK. REPORT ANY DISCREPANCIES VERBALLY AND IN WRITING IMMEDIATELY TO ENGINEER PRIOR TO PROCEEDING WITH WORK. WORK SHALL NOT COMMENCE UNTIL THE DISCREPANCIES ARE RESOLVED. DO NOT CHANGE SIZE OR DIMENSIONS OF STRUCTURAL MEMBERS WITHOUT WRITTEN INSTRUCTIONS FROM THE PROJECT ENGINEER OF RECORD.
9. DISCREPANCIES, OMISSIONS OR VARIATIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS DISCOVERED DURING AND AFTER THE BIDDING PERIOD SHALL BE IMMEDIATELY COMMUNICATED IN WRITING TO THE ENGINEER.
10. CONTRACTOR SHALL PROTECT EXISTING FACILITIES, STRUCTURES AND UTILITY LINES FROM DAMAGE AND SHALL PROTECT HIS WORK, ADJACENT PROPERTY AND THE PUBLIC. CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY. CONSTRUCTION PROCEDURES AND DAMAGE OR INJURY DUE TO HIS ACT OR NEGLIGENCE.
11. CONTRACTOR SHALL SUITABLY DOCUMENT EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF THE WORK, AND SHALL RESTORE ALL DAMAGED OR DISTURBED AREAS TO MEET OR EXCEED ORIGINAL SITE CONDITIONS TO THE OWNER'S SATISFACTION.
12. DO NOT REPRODUCE THE STRUCTURAL DRAWINGS FOR USE AS ERECTION, PLACING, FABRICATION OR SHOP DRAWINGS.
13. SCALING OF DRAWINGS SHALL NOT BE USED TO OBTAIN OR VERIFY ANY DIMENSION SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE ENGINEER FOR INSTRUCTION FOR ANY DIMENSION NOT GIVEN ON DRAWINGS.
14. SEE DRAWINGS OF OTHER TRADES FOR SIZE AND LOCATION OF POSSIBLE ADDITIONAL OPENINGS IN STRUCTURES NOT SHOWN IN STRUCTURAL DRAWINGS.
15. DETAILS LABELED "TYPICAL DETAILS" ON THE DRAWINGS APPLY TO ALL SITUATIONS THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY DETAILED. SUCH DETAILS APPLY WHETHER OR NOT THEY ARE KEYS IN AT EACH LOCATION. QUESTIONS REGARDING APPLICABILITY OF TYPICAL DETAILS SHALL BE RESOLVED BY THE ENGINEER.
16. CONTRACTOR SHALL PROVIDE 48 HOURS MINIMUM ADVANCE NOTICE TO ENGINEER FOR ALL REQUIRED FIELD REVIEWS.
17. CONTRACTOR SHALL COORDINATE WITH OWNER ALL ITEMS TO BE CONTRACTED, SUPPLIED OR INSTALLED BY OWNER.
18. CONTRACTOR IS RESPONSIBLE FOR ALL BUILDING, PERMIT, REVIEW, LICENSE AND DEVELOPMENT FEES REQUIRED TO COMPLETE THE PROJECT.
19. CONTRACTOR SHALL ASSEMBLE AND INSTALL MATERIALS AND PRODUCTS IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND WITH INDUSTRY/ASSOCIATION STANDARDS.
20. MATERIALS OR WORK DESCRIBED IN WORDS WHICH HAVE A WELL-KNOWN TECHNICAL TRADE MEANING SHALL BE HELD TO REFER TO THE RECOGNIZED STANDARD. ALL MATERIALS SHALL BE NEW, U. O. N.
21. PROVIDE FIRE STOPPERS AND SEAL ALL PIPE AND CONDUIT PENETRATIONS THROUGH FIRE RATED FLOORS, WALLS AND CEILINGS IN ORDER TO PREVENT THE PASSAGE OF SMOKE OR FIRE. ALL SEALANTS AND RELATED PRODUCTS SHALL COMPLY WITH THE MINIMUM FIRE RATED REQUIREMENTS FOR THE FLOORS, WALLS AND CEILINGS. ONLY NON-COMBUSTIBLE MATERIALS SHALL BE USED AT PENETRATIONS.
22. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK, HOWEVER, NO CHANGES THAT ALTER THE CHARACTER INTENT OF THE DESIGN WILL BE MADE WITHOUT A CHANGE ORDER..

1. CONTRACTOR SHALL LOCATE IN THE FIELD ALL UTILITIES OCCURRING WITHIN THE LIMITS OF EXCAVATION.
2. CONTRACTOR SHALL CALL SUNSHINE STATE ONE CALL OF FLORIDA, INC. (1—800—432—4770) AT LEAST 48 HOURS BEFORE COMMENCEMENT OF ANY EXCAVATION OPERATIONS ON SITE.
3. DATA CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDER GROUND AND OTHER UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

1. THE DRAWINGS, CALCULATIONS, AND REPRODUCTIONS RELATING TO THE STRUCTURAL PART OF THE PROJECT ARE INSTRUMENTS OF SERVICE TO BE USED FOR THIS PROJECT ONLY.
2. IT IS UNDERSTOOD THAT THE ENGINEER MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, AS TO THE FINDINGS, DESIGNS, RECOMMENDATIONS, SPECIFICATIONS, OR PROFESSIONAL ADVICE EXCEPT THAT THESE INSTRUMENTS OF SERVICE HAVE BEEN PREPARED IN ACCORDANCE WITH CURRENT GENERALLY ACCEPTED PROFESSIONAL ENGINEERING PRACTICES.

1. REVIEW OF SUBMITTALS BY THE ENGINEER IS FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT AS PRESENTED BY THE CONTRACT DOCUMENTS. NO DETAILED CHECK OF QUANTITIES OR DIMENSIONS WILL BE MADE. ONLY THOSE SUBMITTALS REQUIRED TO BE SUBMITTED WILL BE REVIEWED. ALL OTHERS WILL BE RETURNED WITHOUT REVIEW.
2. ALL SUBMITTALS SHALL BE ACCOMPANIED BY A LETTER OF TRANSMITTAL. CONTRACTOR'S SUBMITTAL NUMBER SHALL BE INDICATED ON TRANSMITTAL. DO NOT COMBINE DIFFERENT SUBMITTALS ON THE SAME TRANSMITTAL. SUBMIT SHOP DRAWINGS IN A TIMELY MANNER, CONSISTENT WITH THE ABOVE, AND PRIOR TO FABRICATION, INSTALLATION OR COMMENCEMENT OF THE WORK. ALLOW UP TO 10 WORKING DAYS FOR THE ENGINEER TO REVIEW AND RETURN SHOP DRAWINGS. NUMBER OF COPIES OF EACH SUBMITTED SHOP DRAWING SHALL BE SUFFICIENT FOR ENGINEER TO RETAIN 2 COPIES.
3. ALL SUBMITTALS MUST BEAR EVIDENCE OF CONTRACTOR'S REVIEW (INCLUDING COMPANY STAMP AND DATED SIGNATURE OF REVIEWER) AND MUST BE APPROVED OR APPROVED AS NOTED BY HIM PRIOR TO SUBMITTING TO THE ENGINEER.
4. ALL CHANGES AND ADDITIONS MADE ON RESUBMITTALS MUST BE CLEARLY FLAGGED AND NOTED. THE PURPOSE OF THE RESUBMITTALS MUST BE CLEARLY NOTED ON THE LETTER OF TRANSMITTAL. ENGINEER REVIEW WILL BE LIMITED TO THOSE ITEMS CAUSING THE RESUBMITTAL.
5. DO NOT REPRODUCE THE STRUCTURAL DRAWINGS FOR USE AS ERECTION, PLACING OR FABRICATION DRAWINGS.
6. SUBMITTALS NOT MEETING THE ABOVE CRITERIA OR SUBMITTED AFTER FABRICATION WILL NOT BE REVIEWED.
7. SUBMITTALS:
AS A MINIMUM, THE FOLLOWING SHALL BE SUBMITTED, AS APPLICABLE, TO THE ENGINEER FOR REVIEW AND COMPLIANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS PRIOR TO FABRICATION, INSTALLATION, OR COMMENCEMENT OF THE WORK:
- A. CONCRETE, MORTAR AND GROUT MIX DESIGNS, INCLUDING ADMIXTURE DATA SHEETS.
 - B. BILL OF REINFORCING AND LAYOUT.
 - C. MISCELLANEOUS METAL FABRICATIONS.
 - D. HANDRAIL, GUARDRAIL AND STAIR DETAILS, INCLUDING SUPPORT MEMBERS CONNECTIONS, AND CALCULATIONS.
8. WELDER CERTIFICATIONS FOR ALL WELDERS SHALL BE SUBMITTED. CERTIFICATIONS MUST HAVE BEEN ISSUED WITHIN 3 YEARS PRIOR TO PERFORMING WORK ON THE PROJECT.
9. REQUESTS FOR SUBSTITUTIONS SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR REVIEW. SUBMIT 3 COPIES OF ALL PRODUCT DATA AND CUT SHEETS AS NECESSARY TO SHOW COMPLIANCE WITH THE PROJECT REQUIREMENTS. CONTRACTOR SHALL BEAR THE BURDEN OF OBTAINING AUTHORIZATION FOR USE OF ITEMS TO BE SUBSTITUTED. ENGINEER'S DECISION REGARDING SUBSTITUTION SHALL BE FINAL.
10. FOR ADDITIONAL CRITERIA APPLICABLE TO SUBMITTALS REQUIRING ENGINEERING INPUT BY A DELEGATED ENGINEER, SEE BELOW.

1. SEE INDIVIDUAL PLAN SHEETS FOR DESIGN CRITERIA APPLICABLE TO SPECIFIC SITE COMPONENTS.
2. LOADS SHALL MEET THE MINIMUM DESIGN REQUIREMENTS SET FORTH IN THE FLORIDA BUILDING CODE, EIGHTH EDITION (2023), UNLESS A MORE STRINGENT REQUIREMENT IS INDICATED.
3. FILL HEIGHTS AS SHOWN ON THE PLANS.
4. SEE THIS SHEET FOR SPECIFIC DESIGN LOADS.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE FOR SUPPORTING OF CONSTRUCTION LOADS THAT EXCEED THE ABOVE LOADINGS.

1. A REPORT OF GEOTECHNICAL EXPLORATION HAS BEEN PREPARED FOR THIS PROJECT BY ARDAMAN & ASSOCIATES, INC., FILE NO. 25-9711, DATED MARCH 11, 2025.
2. FOUNDATION CONSTRUCTION, SITE PREPARATION AND SOIL PREPARATION BELOW FOUNDATION SHALL BE PERFORMED IN ACCORDANCE WITH REPORT OF GEOTECHNICAL EXPLORATION.
3. FOUNDATIONS SHALL BE SUPPORTED ON COMPACTED MATERIAL WITH A MINIMUM GROSS SOIL BEARING CAPACITY OF 2000 PSF, U.O.N. THE MODULUS OF VERTICAL SUBGRADE REACTION (K) FOR THE SLAB BEARING SOILS IS ASSUMED TO BE ON THE ORDER OF 100 PSI PER INCH OF VERTICAL DEFLECTION (PCI).
4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY EXISTING FOUNDATION CONDITIONS OR DETAILS THAT ARE IN CONFLICT WITH THOSE INDICATED AND SHOWN ON THE DRAWINGS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION, SHORING, UNDERPINNING, AND ISOLATION, ETC. OF ALL EXISTING FOUNDATION CONDITIONS AS REQUIRED TO PREVENT ANY DISTURBANCE TO EXISTING FOUNDATION CONDITIONS AS A RESULT OF THE WORK.
6. ANCHOR BOLTS SIDE SLEEVES AND OTHER EMBEDDED ITEMS ARE TO BE PLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
7. TO HELP CONTROL SHRINKAGE CRACKS, AT SLAB ON GRADE PENETRATIONS COMPRISED OF BOX—OUTS AND CLOSELY SPACED OR BUNDLED CONDUITS, PIPES, ETC., PROVIDE DIAGONAL #4 BARS ABOUT PERIMETER OF PENETRATION AREA IN ADDITION TO TYPICAL SLAB REINFORCEMENT. ORIENT BARS NORMAL TO ANTICIPATED PATH OF CRACK FOR LONG BAR ENDS SHAL EXTEND 12 INCHES MINIMUM BEYOND OVERLAPS WITH ADJACENT BARS. PROVIDE 2 INCH CLEAR COVER TO TOP SURFACE OF SLAB.
8. CHAIR WELDED WIRE FABRIC (WWF) AND REINFORCING BARS DURING CONCRETE PLACEMENT TO ENSURE PROPER POSITION IN SLAB. CHAIRS SHALL BE OF NON-CORROSIVE MATERIAL INCLUDING, BUT NOT LIMITED TO, FIBER GLASS, PLASTIC, AND CONCRETE BLOCK.
9. FLOOR AND FOUNDATION SLAB SHALL BE WET CURED FOR A MINIMUM OF 7 DAYS PRIOR TO FURTHER CONSTRUCTION.
10. CRACK CONTROL JOINTS SHALL BE SAWCUT IN ACCORDANCE WITH ACI 301 AND ACI 302. COMPLETE SAWCUTTING WITHIN 12 HOURS AFTER CONCRETE PLACEMENT.
11. UNLESS OTHERWISE NOTED, PLACE CRACK CONTROL JOINTS AT 20 FEET MAX. SPACING SO AS TO LIMIT SURFACE AREA BETWEEN JOINTS TO 400 SQ. FT., AND SUCH THAT THE LENGTH — TO— WIDTH RATIO IS LESS THAN 1.5.
12. PLACE CRACK CONTROL JOINTS AT 10 FEET MAX. SPACING FOR SIDEWALKS AND/OR WALKWAYS, SUCH THAT THE LENGTH — TO— WIDTH RATIO IS LESS THAN 1.5.
13. SEE "REINFORCED CONCRETE" NOTES FOR ADDITIONAL INFORMATION PERTAINING TO CONCRETE AND REINFORCEMENT.

FLORIDA BUILDING CODE, EIGHTH EDITION (2023)

WIND SPEED (ULTIMATE)	160 MPH
RISK CATEGORY	III
EXPOSURE	D

EMPTY WEIGHT OF GENERATOR ASSEMBLY	3,434 LBS
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GRATING AND CATWALK	100 PSF
STAIRS	100 PSF
PLATFORM LIVE LOADS	100 PSF
FUEL OF GENERATOR ASSEMBLY	1,270 LBS

SEE LIFT STATION ELEVATION TABLE
ON SHEET S1.1

DEFLECTION LIMIT FOR GRATING AND WALKWAYS = 0.25"

- DELEGATED ENGINEER:
 - A. DEFINITION — A FLORIDA PROFESSIONAL ENGINEER WHO UNDERTAKES A SPECIALTY SERVICE AND PROVIDES SERVICES OR CREATIVE WORK (DELEGATED ENGINEERING DOCUMENT) REGARDING A PORTION OF THE ENGINEERING PROJECT. THE DELEGATED ENGINEER IS THE ENGINEER OF RECORD FOR THAT PORTION OF THE ENGINEERING PROJECT.
 - B. SHALL BE: (1) AN INDEPENDENT CONSULTANT, (2) AN EMPLOYEE OR OFFICER OF AN ENTITY SUPPLYING COMPONENTS TO A FABRICATOR OR CONTRACTOR, SO LONG AS THE ENGINEER ACTS AS AN INDEPENDENT CONSULTANT OR THROUGH A DULY QUALIFIED ENGINEERING CORPORATION, OR (3) AN EMPLOYEE OR OFFICER OF A FABRICATOR OR CONTRACTOR, SO LONG AS THE ENGINEER ACTS AS AN INDEPENDENT CONSULTANT OR THROUGH A DULY QUALIFIED ENGINEERING CORPORATION.
2. SUBMITTALS FOR CUSTOM DESIGNED, MANUFACTURED OR FABRICATED LOAD - CARRYING ITEMS AND CUSTOM FABRICATED ITEMS WHICH ARE REQUIRED BY CODES OR STANDARDS TO RESIST FORCES AND STRESSES, INCLUDING THEIR CONNECTIONS, ANCHORAGES AND ATTACHMENTS REQUIRE A DELEGATED ENGINEER.
3. AS A MINIMUM, THE FOLLOWING SYSTEMS AND COMPONENTS REQUIRE FABRICATION AND ERECTION DRAWINGS WITH INPUT BY A DELEGATED ENGINEER:
 - A. REDESIGN OF ANY STRUCTURAL ELEMENTS OR CONNECTIONS.
 - B. TEMPORARY SHORING.
 - C. HANDRAILS, GUARDRAILS, CATWALK /WALKWAYS, AND STAIRS.
4. FOR EACH CATEGORY OF SUBMITTALS REQUIRING INPUT FROM A DELEGATED ENGINEER, THE CONTRACTOR SHALL ATTACH TO THE FIRST SUBMITTAL A SIGNED AND SEALED LETTER FROM THE RESPONSIBLE DELEGATED ENGINEER STATING "I CERTIFY THAT THE DESIGN AND DRAFTING OF THE SHOP DRAWINGS WHICH ARE SIGNED AND SEALED BY ME WERE PREPARED UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE, THE SHOP DRAWINGS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AND THE CONTRACT DOCUMENTS."
5. SUBMITTALS SHALL CLEARLY IDENTIFY THE SPECIFIC PROJECT AND APPLICABLE CODES, LIST THE DESIGN CRITERIA, AND SHOW ALL DETAILS AND PLANS NECESSARY FOR PROPER FABRICATION AND INSTALLATION. CALCULATIONS AND SHOP DRAWINGS SHALL IDENTIFY SPECIFIC PRODUCTS UTILIZED. GENERIC PRODUCTS WILL NOT BE ACCEPTED.
6. SHOP DRAWINGS AND CALCULATIONS REQUIRE THE SEAL, DATE AND SIGNATURE OF THE DELEGATED ENGINEER. COMPUTER PRINTOUTS ARE AN ACCEPTABLE SUBSTITUTE FOR MANUAL COMPUTATIONS PROVIDED THEY ARE ACCOMPANIED BY SUFFICIENT DESCRIPTIVE INFORMATION TO PERMIT THEIR PROPER EVALUATION. SUCH DESCRIPTIVE INFORMATION SHALL BEAR THE IMPRESSED SEAL AND SIGNATURE OF THE DELEGATED ENGINEER AS AN INDICATION THAT HE HAS ACCEPTED RESPONSIBILITY FOR THE RESULTS.
7. CALCULATIONS ARE THE SOLE RESPONSIBILITY OF THE DELEGATED ENGINEER.
8. CALCULATIONS ARE SUBMITTED TO THE ENGINEER FOR HIS RECORDS.
9. CATALOG INFORMATION ON STANDARD PRODUCTS (i.e. "CUT SHEETS") DOES NOT REQUIRE THE SEAL OF A DELEGATED ENGINEER.
10. REVIEW BY THE PROJECT ENGINEER OF RECORD OF SUBMITTALS IS LIMITED TO VERIFYING THE FOLLOWING:
 - A. THAT THE SPECIFIED STRUCTURAL SUBMITTALS HAVE BEEN FURNISHED.
 - B. THAT THE STRUCTURAL SUBMITTALS HAVE BEEN SIGNED AND SEALED BY THE DELEGATED ENGINEER.
 - C. THAT THE DELEGATED ENGINEER HAS UNDERSTOOD THE DESIGN INTENT AND HAS USED THE SPECIFIED STRUCTURAL CRITERIA. (NO DETAILED CHECK OF CALCULATIONS WILL BE MADE.)
 - D. THAT THE CONFIGURATION SET FORTH IN THE STRUCTURAL SUBMITTALS IS CONSISTENT WITH THE CONTRACT DOCUMENTS. (NO DETAILED CHECK OF DIMENSIONS OR QUANTITIES WILL BE MADE.)
11. SUBMITTALS NOT MEETING THE ABOVE CRITERIA, OR SUBMITTED AFTER FABRICATION, WILL NOT BE REVIEWED.

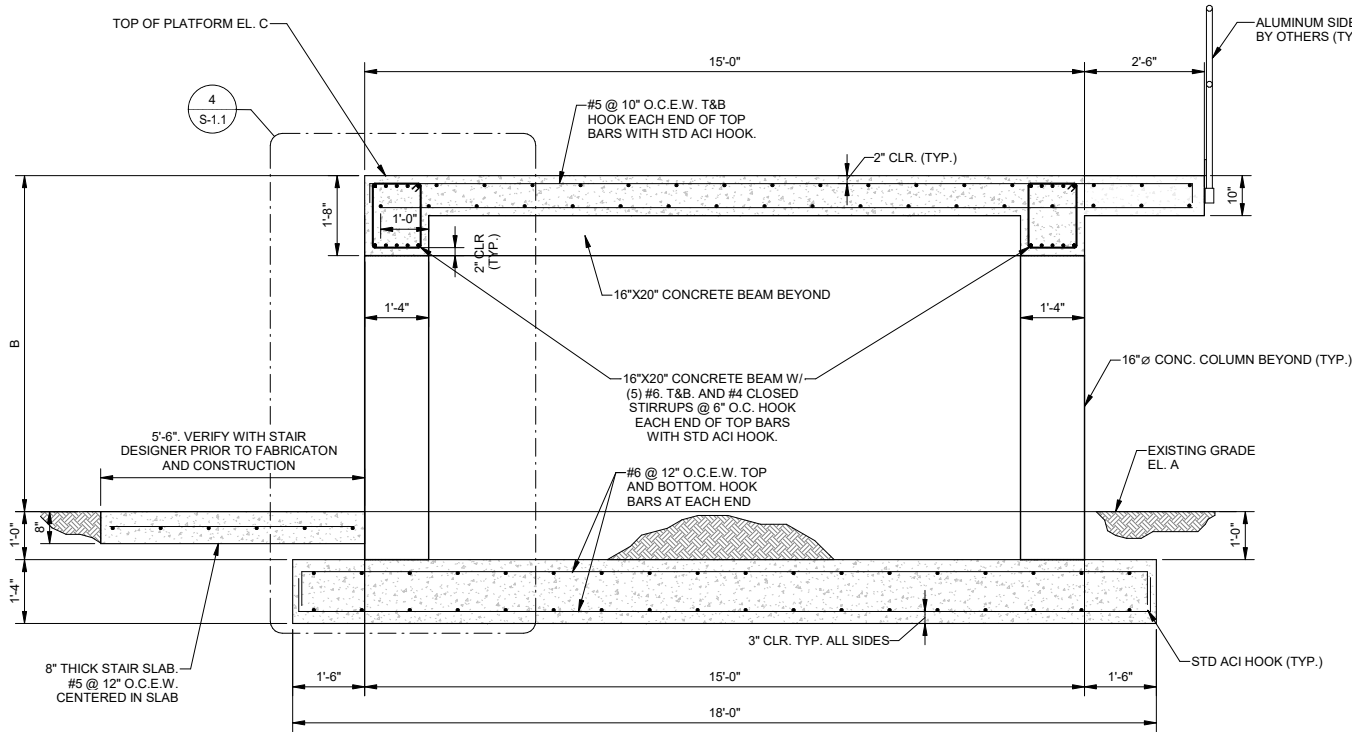
CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		STRUCTURAL GENERAL NOTES		 © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 WEST BAYVIEW AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 WWW.KIMLEY-HORN.COM REGISTRY NO. 35106	
DATE: NOVEMBER 2025		SCALE: AS NOTED		DESIGN ENGINEER:	
PROJECT NO. 148404108		DESIGN: SES		SETHE SCHMID, P.E.	
SHEET NUMBER S-0.1		DRAWN: BTA		FL LICENSE NUMBER 54640	
PINELLAS COUNTY		CHECKED:		DATE:	
FLORIDA				No.	
				Revisions	
				Date	
				By	

[illegible]

[illegible][illegible]

SHEET NUMBER		S-1.0	
PROJECT NO.		148404108	
DATE:		NOVEMBER 2025	
CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PINELLAS COUNTY FLORIDA	
ELEVATED GENERATOR PLATFORM DETAILS		SCALE: AS NOTED DESIGN: SES DRAWN: BTA CHECKED:	
DESIGN ENGINEER:		SETH E. SCHMID, P.E. FL LICENSE NUMBER 54840 DATE:	
Kimley»»Horn		© 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM	
REGISTRY NO. 35106		Revisions	
No.		Date	
By			

C:\Users\Josh.Soldarringo\Documents\148404108 - LS Rehab Structural_Josh.Soldarringo.rvt



3
S-1.1

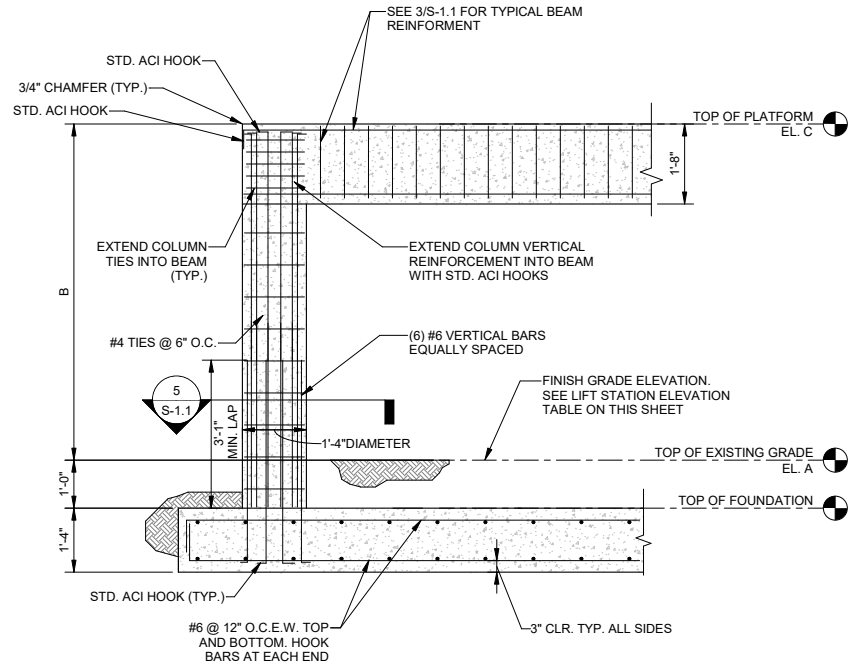
ELEVATED GENERATOR PLATFORM - TYPICAL SECTION
SCALE: 1/2" = 1'-0"

NOTES: 1. REFER TO LIFT STATION ELEVATION TABLE ON THIS SHEET FOR ELEVATIONS AND PLATFORM HEIGHT.
2. STAIRS NOT SHOWN FOR CLARITY

LIFT STATION	BASE FLOOD ELEVATION (ft)*	"A" APPROX. EX. GRADE ELEVATION (ft)	"B" APRROX. PLATFORM HEIGHT (ft)	"C" PLATFORM ELEVATION (ft)
10	11	4.85	6.15	11
4	9	2.95	6.05	9

*FEMA Flood Zone AE Map Numbers (Effective 8/24/2021):
LS 10 - 12103C0257H
LS 4 - 12103C0278H

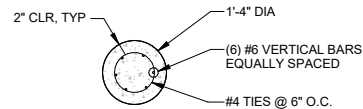
LIFT STATION ELEVATION TABLE



4
S-1.1

TYPICAL COLUMN REINFORCEMENT
SCALE: 1/2" = 1'-0"

NOTES: 1. REFER TO LIFT STATION ELEVATION TABLE ON THIS SHEET FOR ELEVATIONS AND PLATFORM HEIGHT.
2. RAILING NOT SHOWN FOR CLARITY

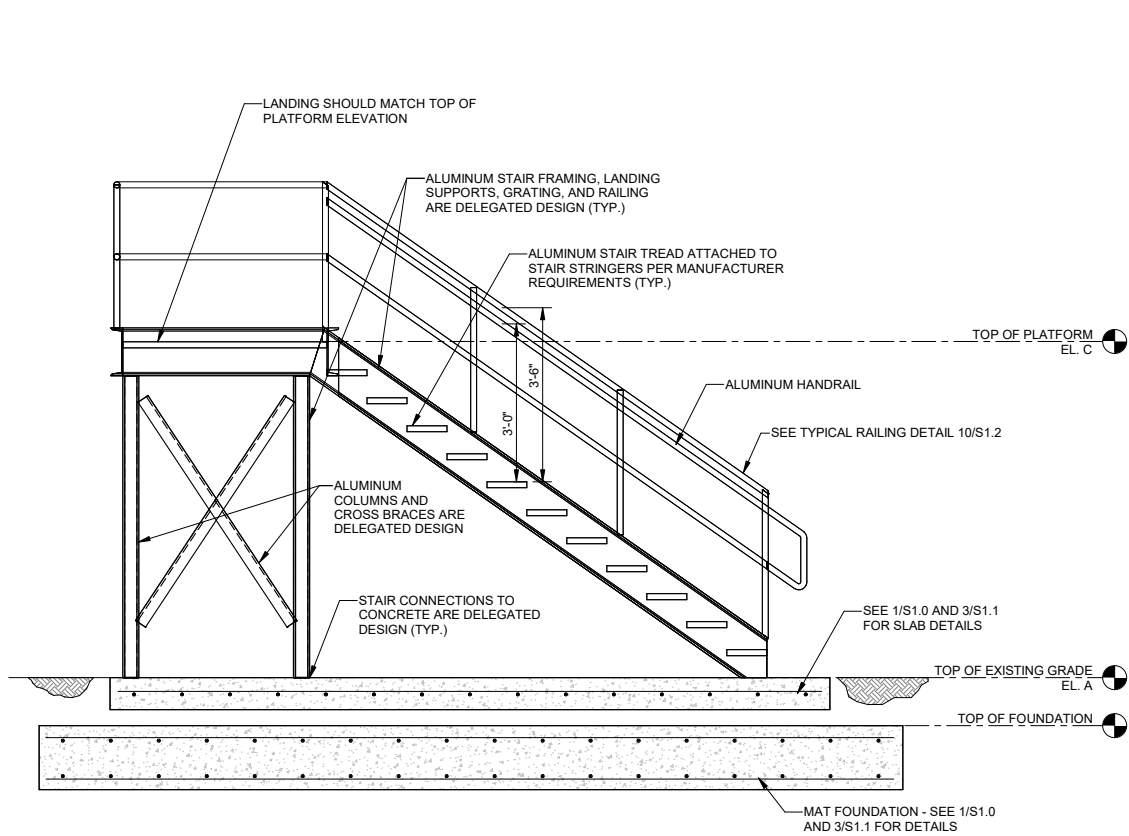


5
S-1.1

COLUMN SECTION
SCALE: 1/2" = 1'-0"

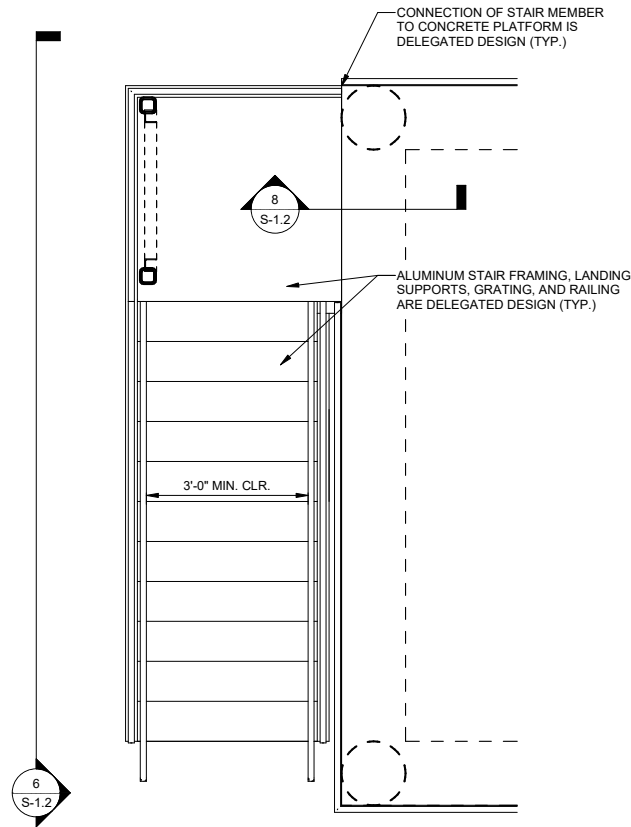
CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PINELLAS COUNTY FLORIDA	
DATE: NOVEMBER 2025		PROJECT NO. 148404108	
SHEET NUMBER S-1.1		SHEET NUMBER S-1.1	
DESIGN ENGINEER: SETH E. SCHMID, P.E. FL LICENSE NUMBER 54640		DESIGN ENGINEER: SETH E. SCHMID, P.E. FL LICENSE NUMBER 54640	
SCALE: AS NOTED		SCALE: AS NOTED	
DESIGN: SES		DESIGN: SES	
DRAWN: BTA		DRAWN: BTA	
CHECKED:		CHECKED:	
ELEVATED GENERATOR PLATFORM DETAILS		ELEVATED GENERATOR PLATFORM DETAILS	
Kimley»Horn		Kimley»Horn	
© 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 WWW.KIMLEY-HORN.COM		© 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 WWW.KIMLEY-HORN.COM	
REGISTRY NO. 35106		REGISTRY NO. 35106	
Revisions		Revisions	
By		By	
Date		Date	

K:\STP_Civil\148404 - City of St. Pete Beach\108 - Lift Station Rehabilitation (LS 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16 and SW LS 35)\CADD\Rev\LS 4, 7, 10\Structural\148404108 - LS Rehab Structural.rvt

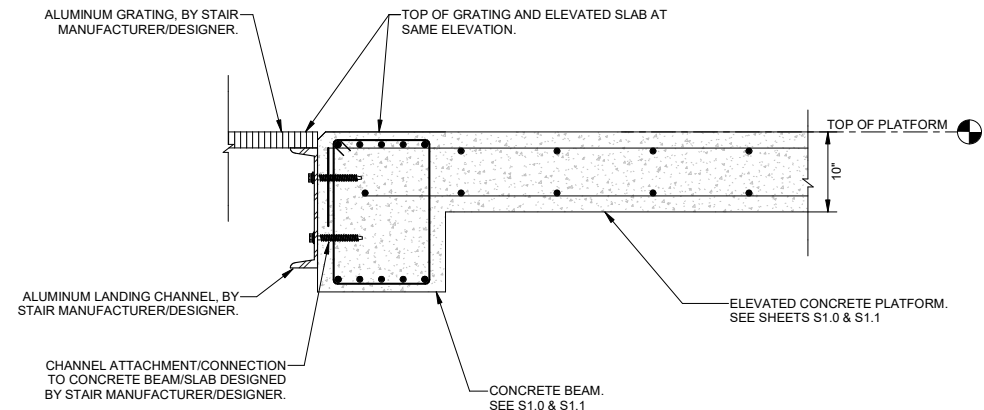


6
S-1.2
ALUMINUM STAIR ELEVATION & FOUNDATIONS
SCALE: 1/2" = 1'-0"

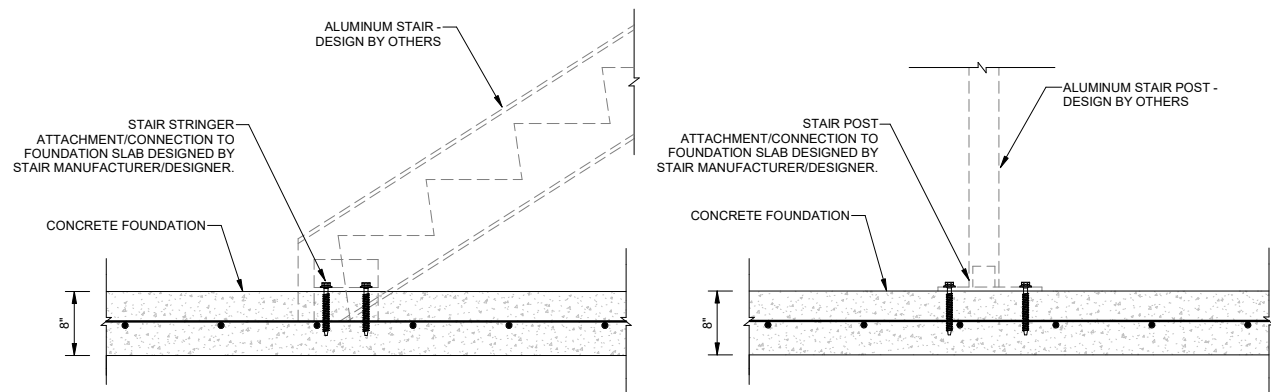
NOTE: 1. DESIGN STAIRS, LANDING, RAILING AND HANDRAILS IN ACCORDANCE WITH THE CURRENT EDITION OF THE FLORIDA BUILDING CODE.
2. REFER TO LIFT STATION ELEVATION TABLE ON SHEET S1.1 FOR ELEVATIONS AND PLATFORM HEIGHT.
3. STAIR MANUFACTURER TO FIELD VERIFY EXISTING GRADE ELEVATION PRIOR TO FABRICATION AND CONSTRUCTION.



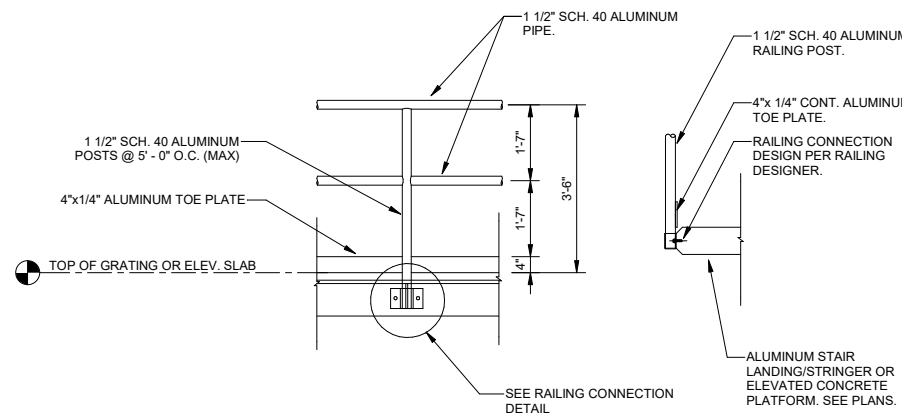
7
S-1.2
ALUMINUM STAIR FRAMING PLAN
SCALE: 1/2" = 1'-0"



8
S-1.2
STAIR LANDING CONNECTION TO PLATFORM
SCALE: 1" = 1'-0"



9
S-1.2
STAIR STRINGER CONNECTION AND POST CONNECTION TO FOUNDATION
SCALE: 1" = 1'-0"



10
S-1.2
TYPICAL RAILING DETAIL
SCALE: 1/2" = 1'-0"

DESIGN SPECIFICATIONS FOR FACTORY-INDUSTRIAL RAILING APPLICATIONS

1. RAILING SHALL BE DESIGNED IN ACCORDANCE WITH THE CURRENT EDITION OF THE FLORIDA BUILDING CODE.
2. THE MANUFACTURER SHALL SUBMIT CALCULATIONS SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER FOR REVIEW.
3. POST SPACING SHALL BE A MAXIMUM OF 6'-0". POSTS AND RAILINGS SHALL BE A MINIMUM OF 1 1/2" SCH. 40 ALUMINUM PIPE, ALLOY 6063-T6, ASTM-B-429 OR ASTM-B-221. THE RAILING MANUFACTURER SHALL SHOW THAT THEIR POSTS ARE OF ADEQUATE STRENGTH TO MEET THE LOADING REQUIREMENTS. IF THE MANUFACTURER'S POSTS ARE NOT OF ADEQUATE STRENGTH, THE MANUFACTURER MAY REDUCE POST SPACING, OR ADD REINFORCING DOWEL, OR DO BOTH TO MEET LOADING REQUIREMENTS.
4. POSTS SHALL NOT INTERRUPT CONTINUATION OF THE TOP RAIL AT ANY POINT ALONG THE RAILING, INCLUDING CORNERS AND END TERMINATIONS (OSHA 191023). THE TOP SURFACE OF THE TOP RAILING SHALL BE SMOOTH AND UNINTERRUPTED BY PROJECTING FITTINGS.
5. THE MIDRAIL AT A CORNER RETURN SHALL BE ABLE TO WITHSTAND A 200 LB. LOAD WITHOUT LOOSENING. THE MANUFACTURER IS TO DETERMINE THIS DIMENSIONS FOR THEIR SYSTEM.
6. TOE PLATE SHALL CONFORM TO OSHA STANDARDS. TOE PLATE SHALL BE A MINIMUM OF 4" HIGH AND SHALL BE AN EXTRUSION THAT ATTACHES TO THE POSTS TO ALLOW FOR EXPANSION AND CONTRACTION BETWEEN POSTS. TOE PLATES SHALL BE SET 1/4" ABOVE THE WALKING SURFACE. TOE PLATES SHALL BE PROVIDED ON RAILINGS AS REQUIRED BY OSHA AND/OR AS SHOWN ON DRAWINGS.
7. FIELD WELDING OF THE ALUMINUM RAILING IS NOT ALLOWED.

No.	Revisions	Date	By

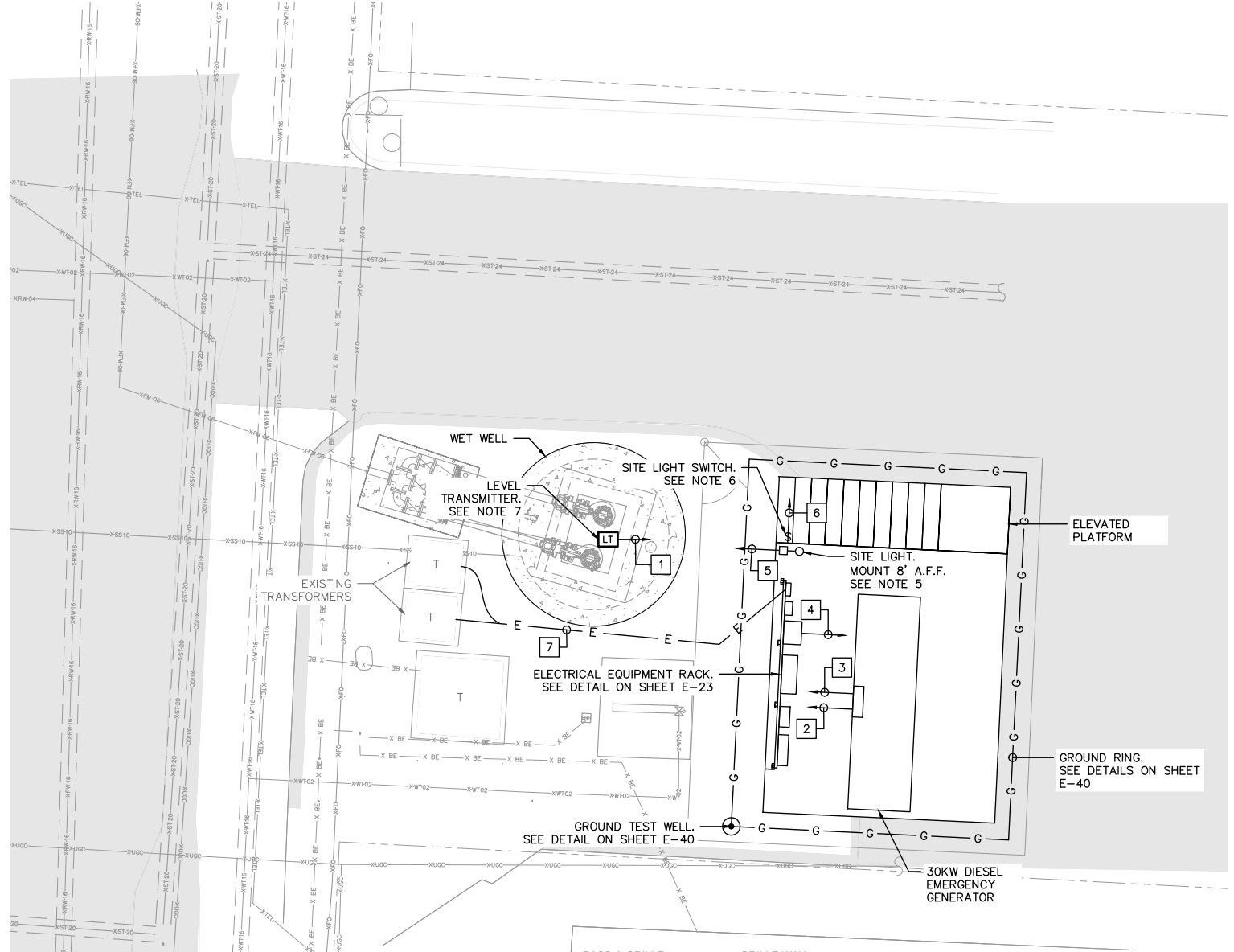
DESIGN ENGINEER:	KIMLEY»Horn	© 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM	REGISTRY NO. 35106
SETH E. SCHMID, P.E.			
FL LICENSE NUMBER			
54640			
DATE:			

SCALE:	AS NOTED
DESIGN:	SES
DRAWN:	BTA
CHECKED:	

STRUCTURAL - STAIR DETAILS

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00	FLORIDA PINELLAS COUNTY
--	----------------------------

DATE:	NOVEMBER 2025
PROJECT NO.	148404108
SHEET NUMBER	S-1.2

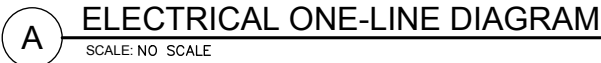


A ELECTRICAL SITE PLAN
SCALE: 1" = 5'

- KEY NOTES:**
- 1 LEVEL TRANSMITTER CABLE IN EXISTING 1-1/4" CONDUIT TO SCADA PANEL ON ELECTRICAL EQUIPMENT RACK
 - 2 #12 AND #12 GND. IN 3/4" CONDUIT TO PUMP CONTROL PANEL ON ELECTRICAL EQUIPMENT RACK
 - 3 #14 IN AND (1) ETHERNET CABLE 1" CONDUIT TO SCADA PANEL ON ELECTRICAL EQUIPMENT RACK
 - 4 #14 AND (1) ETHERNET CABLE IN 1" CONDUIT TO SCADA PANEL ON ELECTRICAL EQUIPMENT RACK
 - 5 #12 AND #12 GND. IN 1" CONDUIT TO PUMP CONTROL PANEL ON ELECTRICAL EQUIPMENT RACK
 - 6 #12 AND #12 GND. IN 1" CONDUIT TO SITE LIGHT
 - 7 #1 IN 1-1/2" CONDUIT TO EXISTING PAD-MOUNTED TRANSFORMER

- KEY NOTES:**
- 1 LEVEL TRANSMITTER CABLE IN EXISTING 1-1/4" CONDUIT TO SCADA PANEL ON ELECTRICAL EQUIPMENT RACK
 - 2 #12 AND #12 GND. IN 3/4" CONDUIT TO PUMP CONTROL PANEL ON ELECTRICAL EQUIPMENT RACK
 - 3 #14 IN AND (1) ETHERNET CABLE 1" CONDUIT TO SCADA PANEL ON ELECTRICAL EQUIPMENT RACK
 - 4 #14 AND (1) ETHERNET CABLE IN 1" CONDUIT TO SCADA PANEL ON ELECTRICAL EQUIPMENT RACK
 - 5 #12 AND #12 GND. IN 1" CONDUIT TO PUMP CONTROL PANEL ON ELECTRICAL EQUIPMENT RACK
 - 6 #12 AND #12 GND. IN 1" CONDUIT TO SITE LIGHT
 - 7 #1 IN 1-1/2" CONDUIT TO EXISTING PAD-MOUNTED TRANSFORMER

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		LIFT STATION 4 REHABILITATION ELECTRICAL SITE PLAN		SCALE: AS NOTED		DESIGN ENGINEER:		Kimley»»Horn © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727 547 3999 WWW.KIMLEY-HORN.COM REGISTRY NO. 35106																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</
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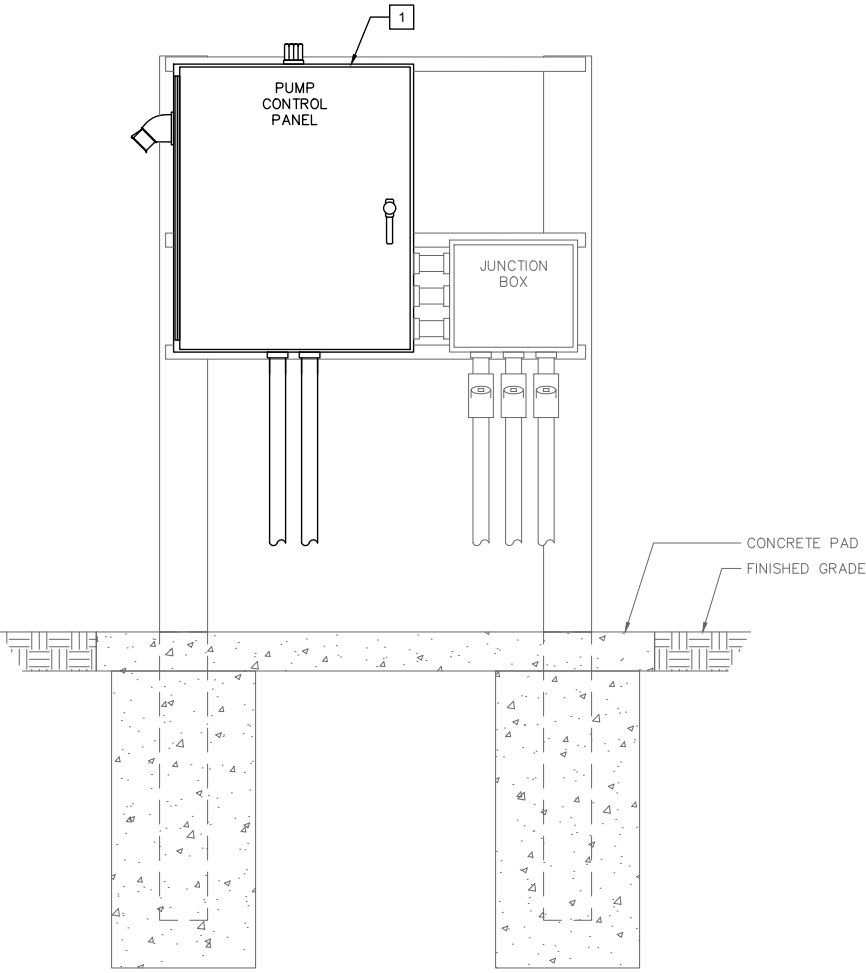
SCALE: NO SCALE

1. COORDINATE RELOCATION OF ELECTRIC SERVICE WITH DUKE ENERGY.
2. REUSE EXISTING CONDUIT TO THE FULLEST EXTENT POSSIBLE.
3. CONDUITS SHOWN ARE REPRESENTATIVE ONLY. CONTRACTOR SHALL DETERMINE CONDUIT LOCATION AND ROUTING.
4. COORDINATE FLOAT LEVEL SWITCH ELEVATIONS WITH THE CITY.
5. EXISTING FLOATS NOT USED SHALL BE SECURED ABOVE THE HIGH LEVEL FLOAT FOR USE AS SPARES.

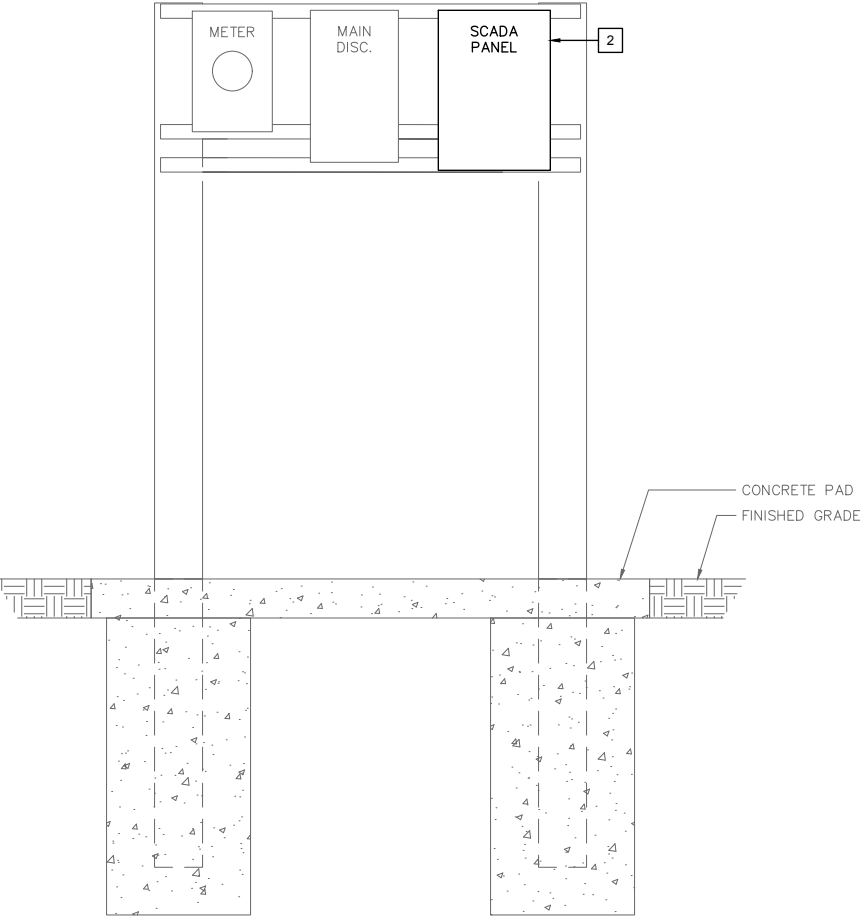
- 1 PRIMARY UNDERGROUND ELECTRIC SERVICE
- 2 4#1 IN 1-1/2" CONDUIT
- 3 4#1 AND #6 GND. IN 2" CONDUIT
- 4 3#10, 4#14, AND #10 GND. IN 2" CONDUIT
- 5 SUBMERSIBLE PUMP CABLES IN 2" CONDUIT
- 6 8#14 IN 2" CONDUIT
- 7 FLOAT SWITCH CABLES IN 2" CONDUIT
- 8 10#14 (120VAC) AND #14 GND. IN 3/4" CONDUIT
- 9 26#14 (24VDC) AND (6) 1 PR. #16 SHLD. IN 2" CONDUIT

ELECTRICAL LOAD SUMMARY		
SERVICE VOLTAGE:	240	V
PHASE:	3	
CONNECTED LOAD:	15.64	KVA
	37.62	A
DEMAND LOAD:	17.22	KVA
	41.42	A
LOAD MULTIPLIER:	1.25	
MINIMUM SERVICE:	21.52	KVA
	51.77	A
SEVICE ENTRANCE TRIP RATING:	125	A
MINIMUM SHORT CIRCUIT CURRENT RATING:	22	KAIC

DATE: DECEMBER 2025
PROJECT NO. 148404108
SHEET NUMBER E-03



A ELECTRICAL EQUIPMENT RACK – ATL
FRONT ELEVATION
SCALE: NO SCALE



B ELECTRICAL EQUIPMENT RACK – ATL
REAR ELEVATION
SCALE: NO SCALE

- GENERAL NOTES:**
1. INSTALL CONDUITS AND CONDUCTORS FOR SERVICE AND EQUIPMENT GROUND AS REQUIRED BY APPLICABLE CODES AND SPECIFICATIONS.
 2. REUSE EXISTING CONDUIT TO THE FULLEST EXTENT POSSIBLE.
 3. CONDUITS SHOWN ARE REPRESENTATIVE ONLY. CONTRACTOR SHALL DETERMINE CONDUIT LOCATION AND ROUTING.
 4. SEE ONE-LINE DIAGRAMS FOR ADDITIONAL CONDUIT AND WIRING.

- KEY NOTES:**
- 1 REPLACE EXISTING PUMP CONTROL PANEL. SEE SHEETS E-26 THROUGH E-29 FOR PUMP CONTROL PANEL LAYOUT AND WIRING DIAGRAMS.
 - 2 CITY PROVIDED AND INSTALLED SCADA PANEL AND ANTENNA. COORDINATE REPLACEMENT WITH THE CITY.

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PINELLAS COUNTY FLORIDA	
DATE: DECEMBER 2025		PROJECT NO. 148404108	
SHEET NUMBER E-22		SHEET NUMBER E-22	
ELECTRICAL EQUIPMENT RACK - ATL		DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453 DATE:	
SCALE: AS NOTED	DESIGN: JAH	DRAWN: EBW	CHECKED: JAH
		© 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM REGISTRY NO. 95106	
No.	Revisions	Date	By



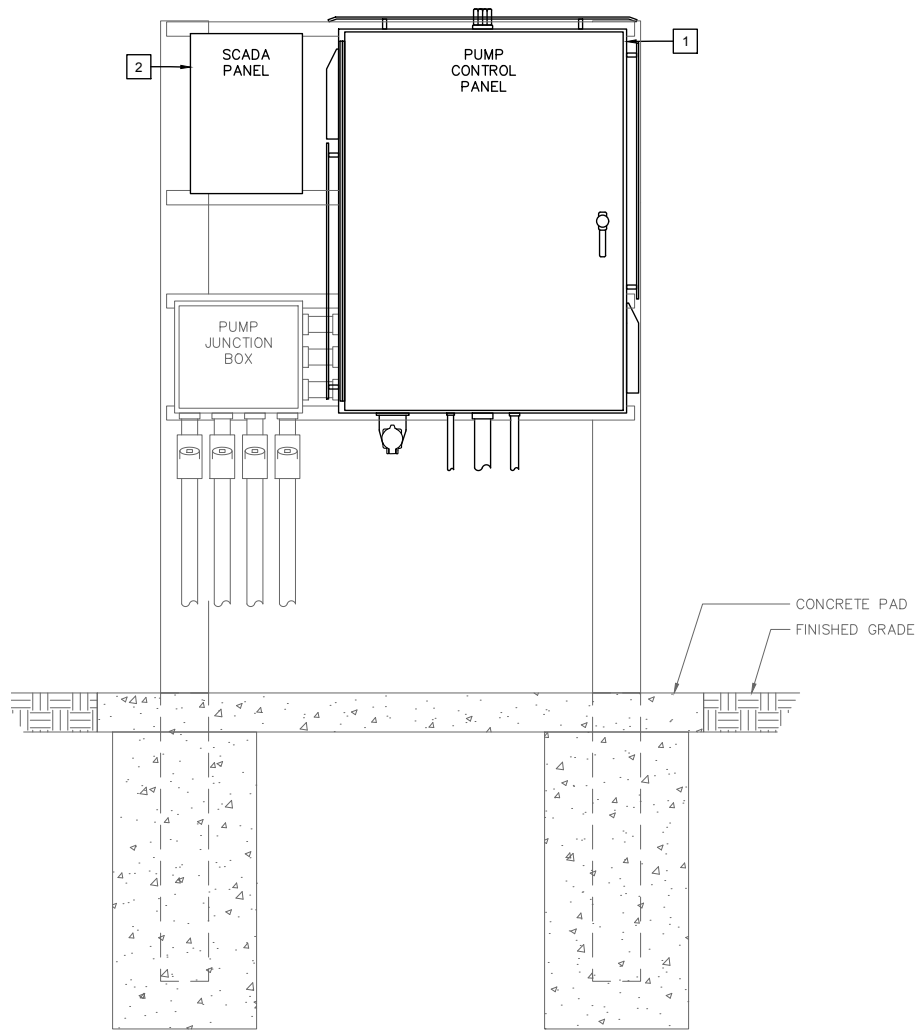


- 1 ELECTRIC METER IN ALUMINUM ENCLOSURE. COORDINATE ELECTRIC METER INSTALLATION WITH ALL UTILITY REQUIREMENTS.
- 2 HEAVY DUTY, PAD-LOCKABLE, 200A-240V-3P NEMA 4X STAINLESS STEEL FUSIBLE DISCONNECT, SERVICE ENTRANCE RATED. FUSES SHALL BE 240V, 125A, DUAL-ELEMENT, TIME-DELAY RK5 FUSES.
- 3 ASCO 300 SERIES 150A-240V-3P NEMA 4X STAINLESS STEEL AUTOMATIC TRANSFER SWITCH.
- 4 SEE SHEETS E-30 THROUGH E-34 FOR PUMP CONTROL PANEL LAYOUT AND WIRING DIAGRAMS.
- 5 PROVIDE TERMINALS AS REQUIRED IN JUNCTION BOX FOR PUMP CABLES AND FLOAT SWITCH CABLES.
- 6 CITY PROVIDED AND INSTALLED SCADA PANEL AND ANTENNA. COORDINATE REPLACEMENT WITH THE CITY.

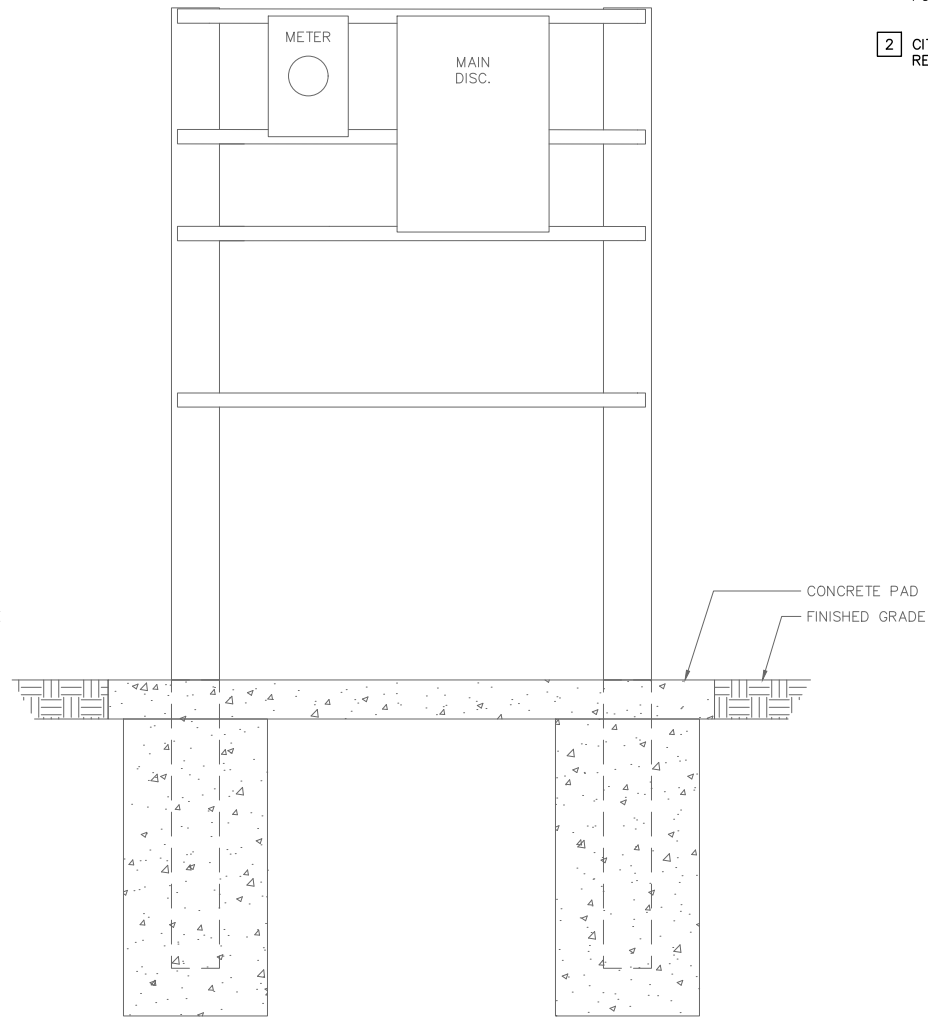
SCALE:	AS NOTED	DESIGN ENGINEER: JASON A. HOYT, P.E. FLICENSE NUMBER 101453 DATE:
DESIGN:	JAH	
DRAWN:	EBW	
CHECKED:	JAH	

ELEVATED ELECTRICAL EQUIPMENT RACK - VFD

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00	DATE:	FLORIDA
	DECEMBER 2025	PINELLAS COUNTY
	PROJECT NO.	
	148404108	
SHEET NUMBER	E-24	



A ELECTRICAL EQUIPMENT RACK – RVSS
FRONT ELEVATION
SCALE: NO SCALE



B ELECTRICAL EQUIPMENT RACK – RVSS
REAR ELEVATION
SCALE: NO SCALE

GENERAL NOTES:

1. INSTALL CONDUITS AND CONDUCTORS FOR SERVICE AND EQUIPMENT GROUND AS REQUIRED BY APPLICABLE CODES AND SPECIFICATIONS.
2. REUSE EXISTING CONDUIT TO THE FULLEST EXTENT POSSIBLE.
3. CONDUITS SHOWN ARE REPRESENTATIVE ONLY. CONTRACTOR SHALL DETERMINE CONDUIT LOCATION AND ROUTING.
4. SEE ONE-LINE DIAGRAM ON SHEET E-17 FOR ADDITIONAL CONDUIT AND WIRING.

KEY NOTES:

- 1 REPLACE EXISTING PUMP CONTROL PANEL. SEE SHEETS E-35 THROUGH E-39 FOR PUMP CONTROL PANEL LAYOUT AND WIRING DIAGRAMS.
- 2 CITY PROVIDED AND INSTALLED SCADA PANEL AND ANTENNA. COORDINATE REPLACEMENT WITH THE CITY.

No.	Revisions	Date	By

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REGISTRY NO. 95106

DESIGN ENGINEER:	JASON A. HOYT, P.E. FL LICENSE NUMBER 101453
DATE:	
SCALE:	AS NOTED
DESIGN:	JAH
DRAWN:	EBW
CHECKED:	JAH

ELECTRICAL EQUIPMENT RACK -
RVSS

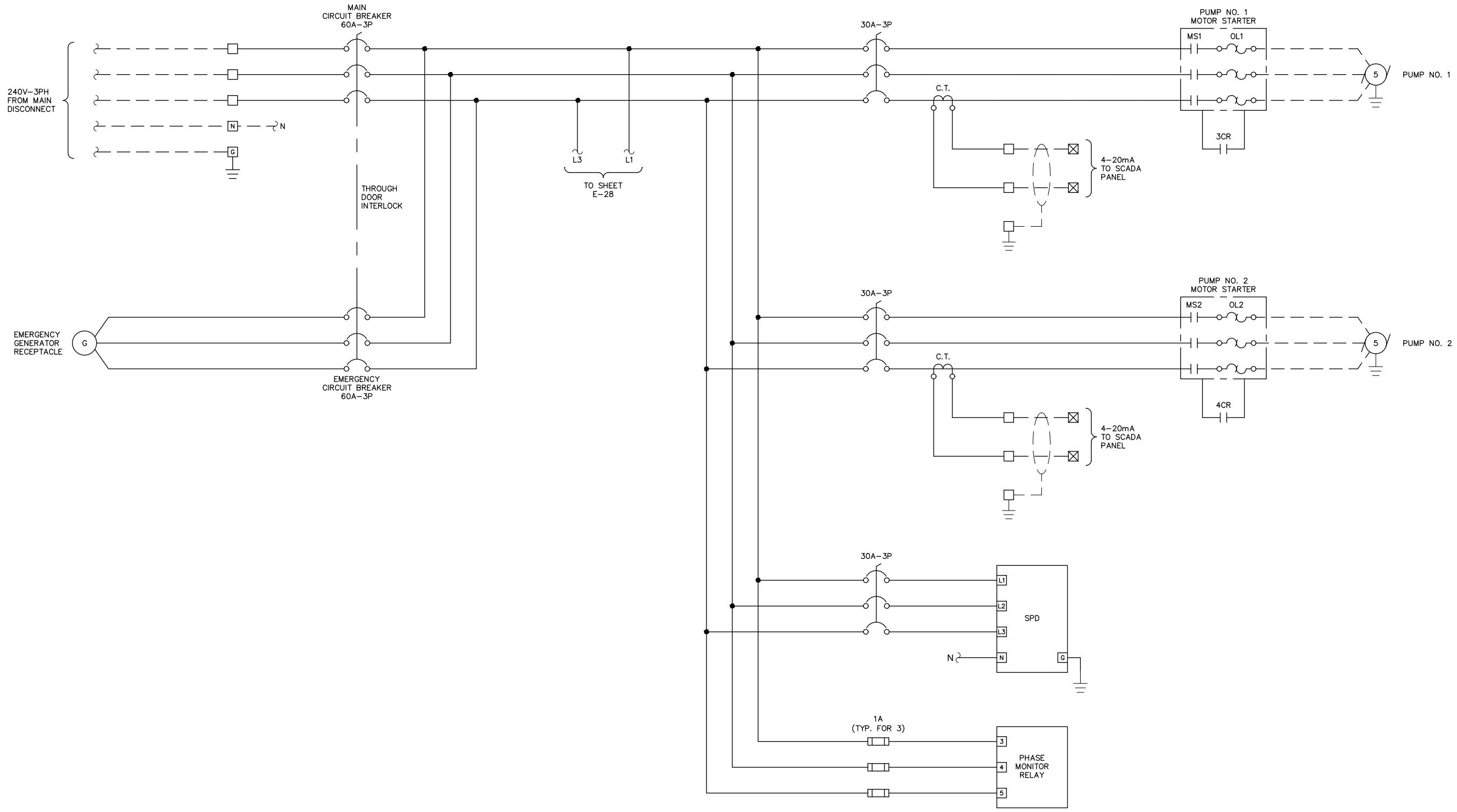
CITY OF ST. PETE BEACH
PUMP & LIFT STATION
REHABILITATIONS
PID# PS26-401-608-00
PINELLAS COUNTY
FLORIDA

DATE:	DECEMBER 2025
PROJECT NO.	148404108
SHEET NUMBER	E-25



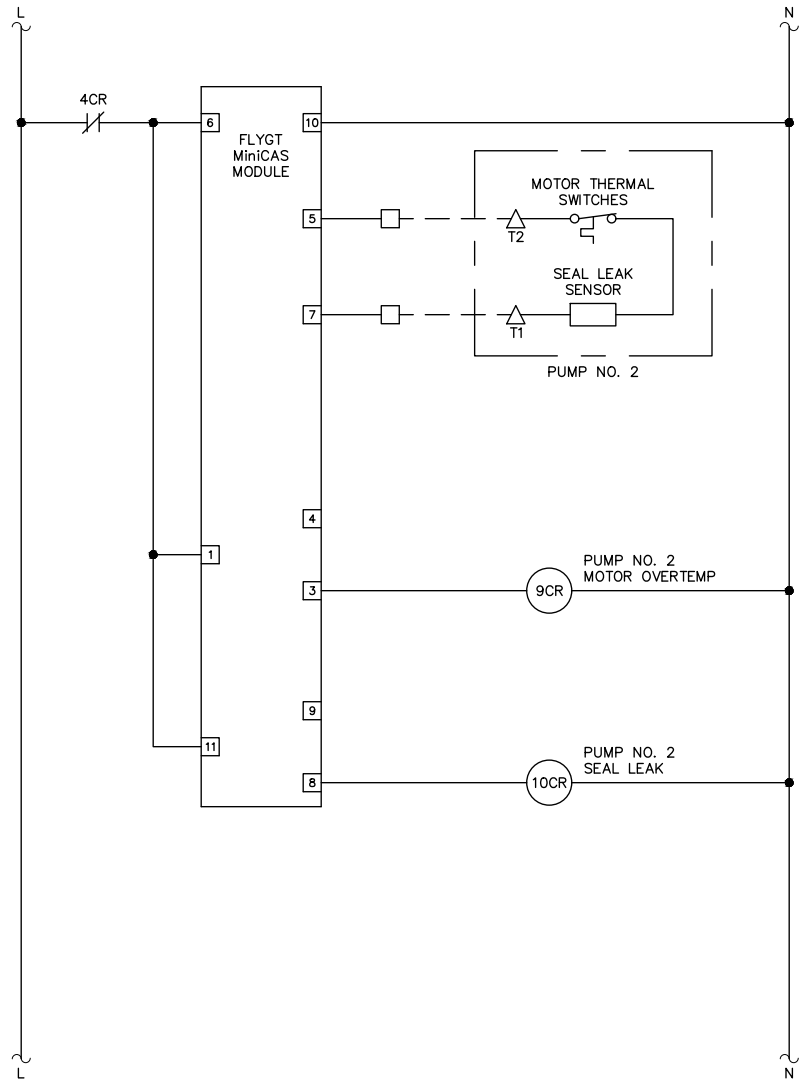
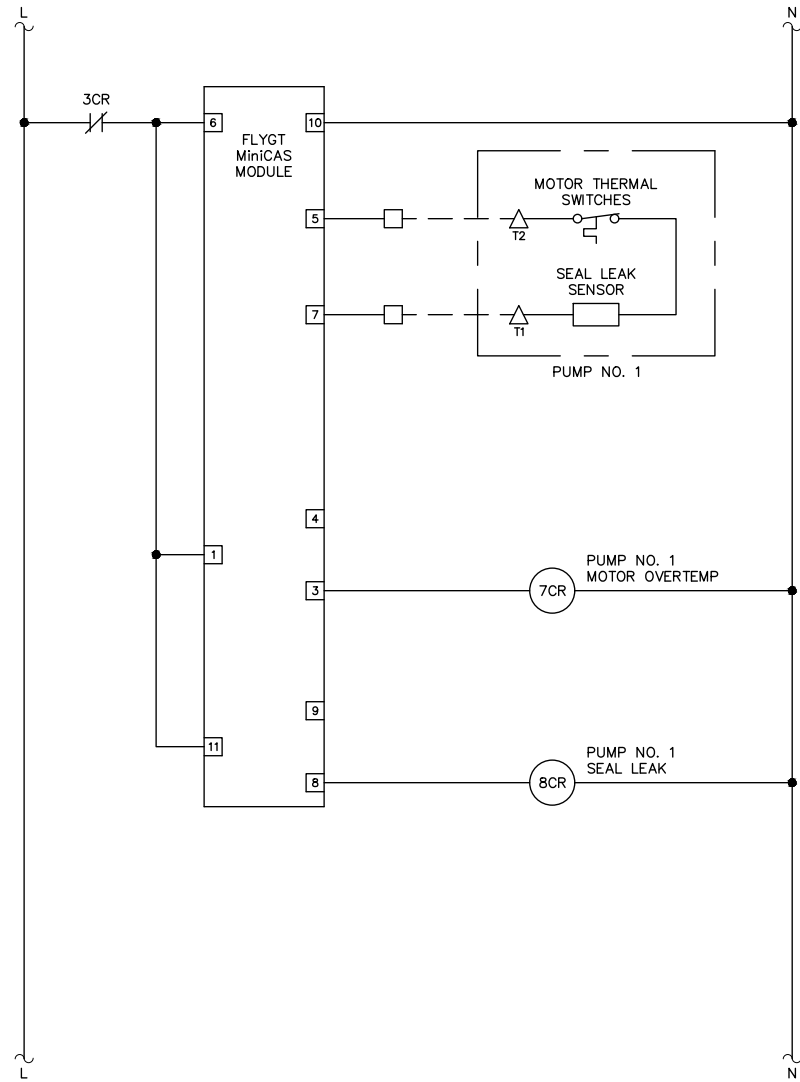
- 1 PROVIDE 36" X 30" X 12", 316 STAINLESS STEEL ENCLOSURE WITH PAD-LOCKABLE 3-POINT LATCH.
- 2 PROVIDE NEMA 4X RED ALARM LIGHT.
- 3 PROVIDE EMERGENCY GENERATOR RECEPTACLE. COORDINATE REQUIREMENTS WITH THE CITY. GENERATOR RECEPTACLE SHALL BE INSTALLED OPPOSITE OF JUNCTION BOX; UNLESS ON ELEVATED PLATFORM, THEN SHALL BE INSTALLED ON THE BOTTOM OF THE PUMP CONTROL PANEL.
- 4 PROVIDE SWING-OUT PANEL AND DOOR STOP KIT.
- 5 ALL CIRCUIT BREAKERS SHALL BE ACCESSIBLE THROUGH THE SWING-OUT.

Page 57 of 290



GENERAL NOTES:
1. OVERLOAD RELAYS SHALL BE ELECTRONIC TYPE, CAPABLE OF BEING RESET USING A REMOTE DRY CONTACT.

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PINELLAS COUNTY FLORIDA	
DATE: DECEMBER 2025		PROJECT NO. 148404108	
SHEET NUMBER E-27		SHEET NUMBER E-27	
SCALE: AS NOTED		DESIGN: JAH	
DRAWN: EBW		CHECKED: JAH	
DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453		DATE: JAH	
PUMP CONTROL PANEL WIRING DIAGRAM - ATL		Kimley»Horn	
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CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PUMP CONTROL PANEL WIRING DIAGRAM - ATL		DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453		Kimley»Horn © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 WWW.KIMLEY-HORN.COM P: 727.547.3999 REGISTRY NO. 35106		No.		Revisions		Date		By	
DATE: DECEMBER 2025		PROJECT NO. 148404108		SHEET NUMBER E-29											



- 1 PROVIDE 48" X 36" X 12", 316 STAINLESS STEEL ENCLOSURE WITH PAD-LOCKABLE 3-POINT LATCH.
- 2 PROVIDE NEMA 4X RED ALARM LIGHT.
- 3 PROVIDE STAINLESS STEEL SUN-SHIELDS ON THE TOP AND SIDES OF THE ENCLOSURE. ATTACH SUN-SHIELDS WITH STAINLESS STEEL HARDWARE.
- 4 PROVIDE ENCLOSURE COOLING FANS WITH STAINLESS STEEL SHROUDS. SIZE ENCLOSURE COOLING FANS TO ADEQUATELY DISSIPATE HEAT.
- 5 PROVIDE SWING-OUT PANEL AND DOOR STOP KIT.
- 6 PROVIDE VARIABLE FREQUENCY DRIVE REMOTE KEYPAD.
- 7 PROVIDE EMERGENCY GENERATOR RECEPTACLE. COORDINATE REQUIREMENTS WITH THE CITY.
- 8 ALL CIRCUIT BREAKERS SHALL BE ACCESSIBLE THROUGH THE SWING-OUT.

[illegible]

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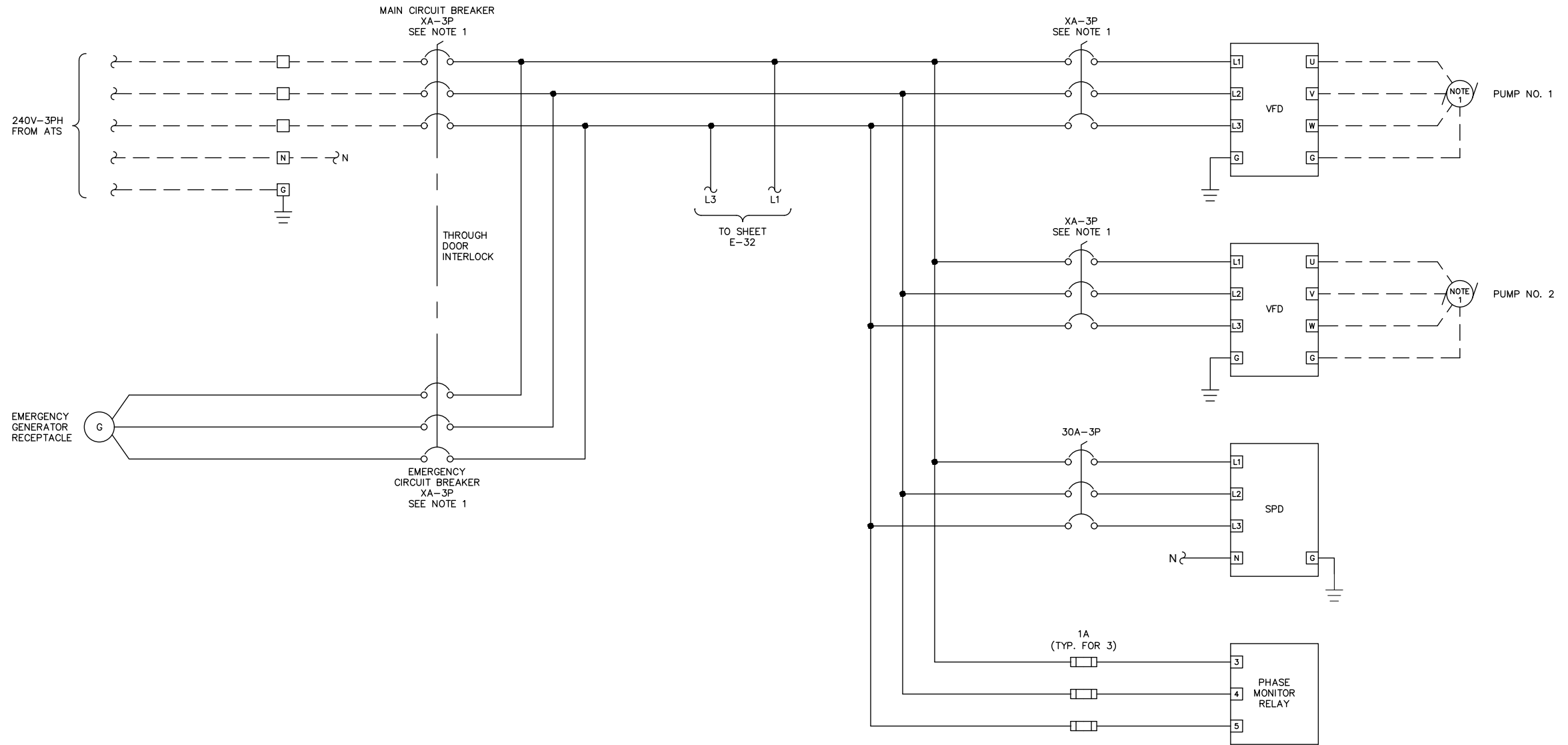
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DESIGN:	JAH	
DRAWN:	EBW	
CHECKED:	JAH	

PUMP CONTROL PANEL LAYOUT - VFD

CITY OF ST. PETE BEACH
PUMP & LIFT STATION
REHABILITATIONS
PID# PS26-401-608-00

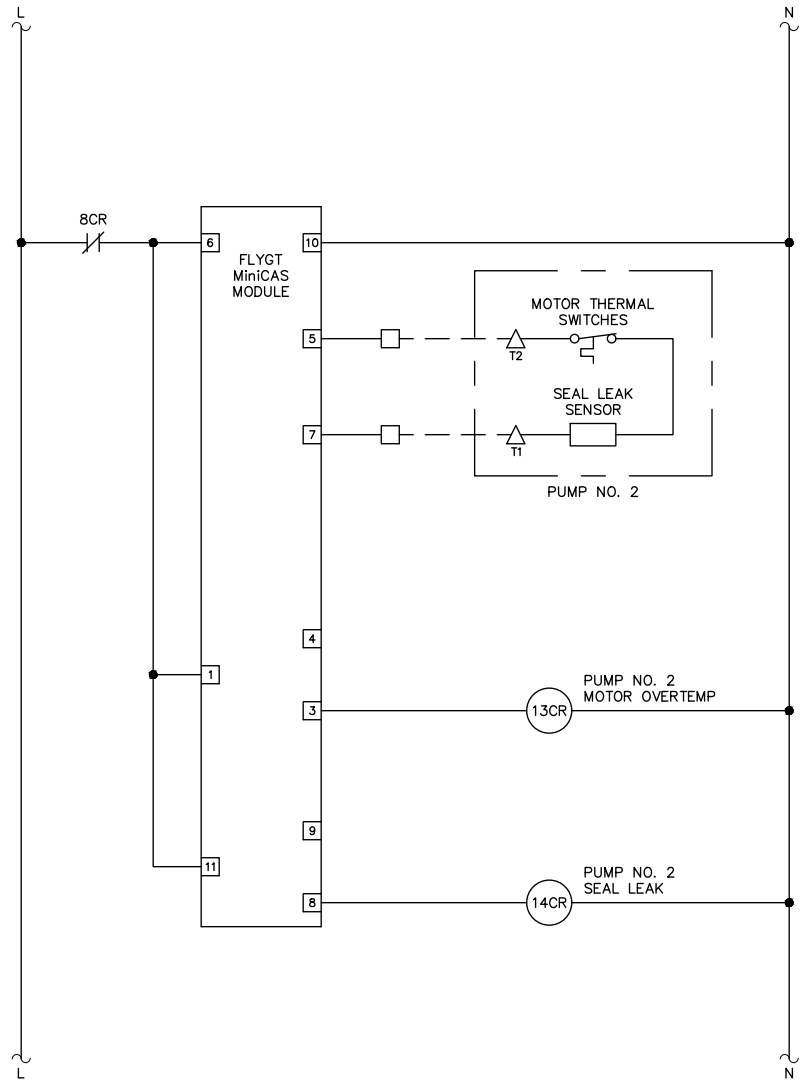
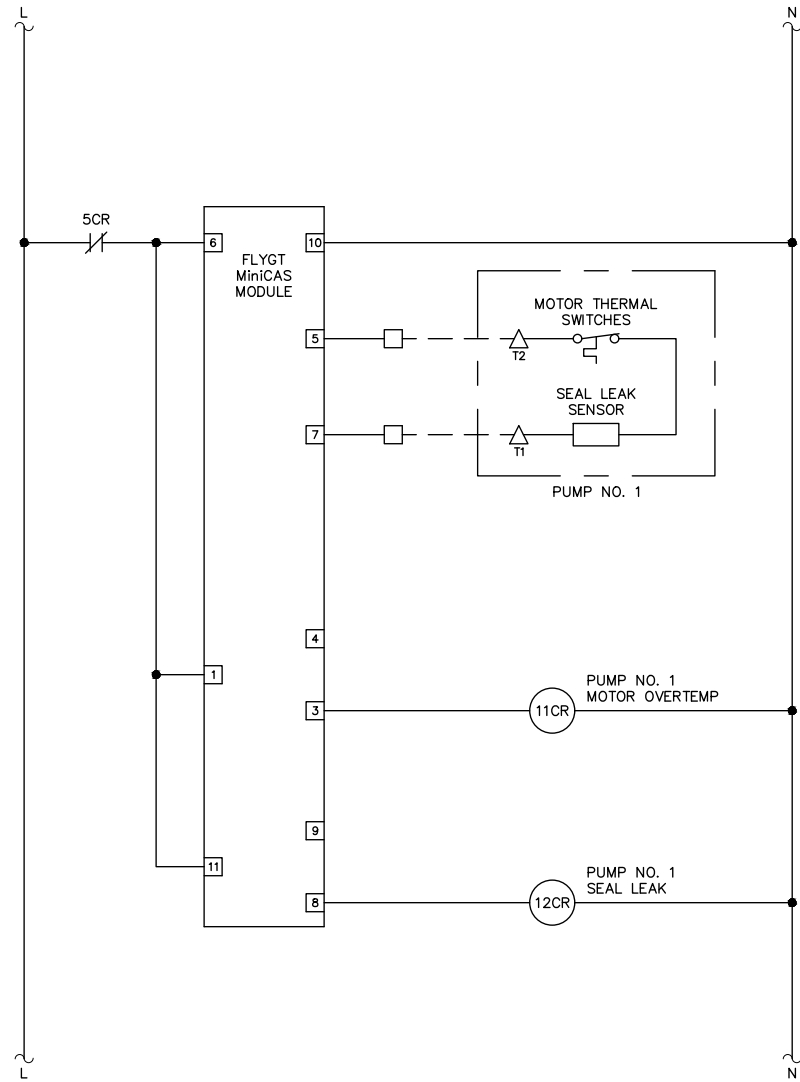
PINELLAS COUNTY
FLORIDA

DATE: DECEMBER 2025
PROJECT NO. 148404108
SHEET NUMBER E-30



GENERAL NOTES:
1. SEE ONE-LINE DIAGRAMS FOR PUMP AND BREAKER SIZES.

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PINELLAS COUNTY FLORIDA	
DATE: DECEMBER 2025		PROJECT NO. 148404108	
SHEET NUMBER E-31		SHEET NUMBER E-31	
PUMP CONTROL PANEL WIRING DIAGRAM - VFD		DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453 DATE: JAH	
SCALE: AS NOTED DESIGN: JAH DRAWN: EBW CHECKED: JAH		Kimley»Horn © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM REGISTRY NO. 35106	
		Revisions	
		Date	
		By	

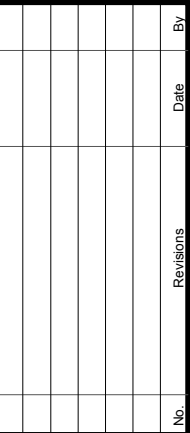


CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PUMP CONTROL PANEL WIRING DIAGRAM - VFD		DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453		Kimley»Horn © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM		Revisions		By	
DATE: DECEMBER 2025		PROJECT NO. 148404108		SHEET NUMBER E-33		No.		Date		By	



- 1 PROVIDE 48" X 36" X 12", 316 STAINLESS STEEL ENCLOSURE WITH PAD-LOCKABLE 3-POINT LATCH.
- 2 PROVIDE NEMA 4X RED ALARM LIGHT.
- 3 PROVIDE STAINLESS STEEL SUN-SHIELDS ON THE TOP AND SIDES OF THE ENCLOSURE. ATTACH SUN-SHIELDS WITH STAINLESS STEEL HARDWARE.
- 4 PROVIDE ENCLOSURE COOLING FANS WITH STAINLESS STEEL SHROUDS. SIZE ENCLOSURE COOLING FANS TO ADEQUATELY DISSIPATE HEAT.
- 5 PROVIDE SWING-OUT PANEL AND DOOR STOP KIT.
- 6 PROVIDE EMERGENCY GENERATOR RECEPTACLE. COORDINATE REQUIREMENTS WITH THE CITY.
- 7 ALL CIRCUIT BREAKERS SHALL BE ACCESSIBLE THROUGH THE SWING-OUT.

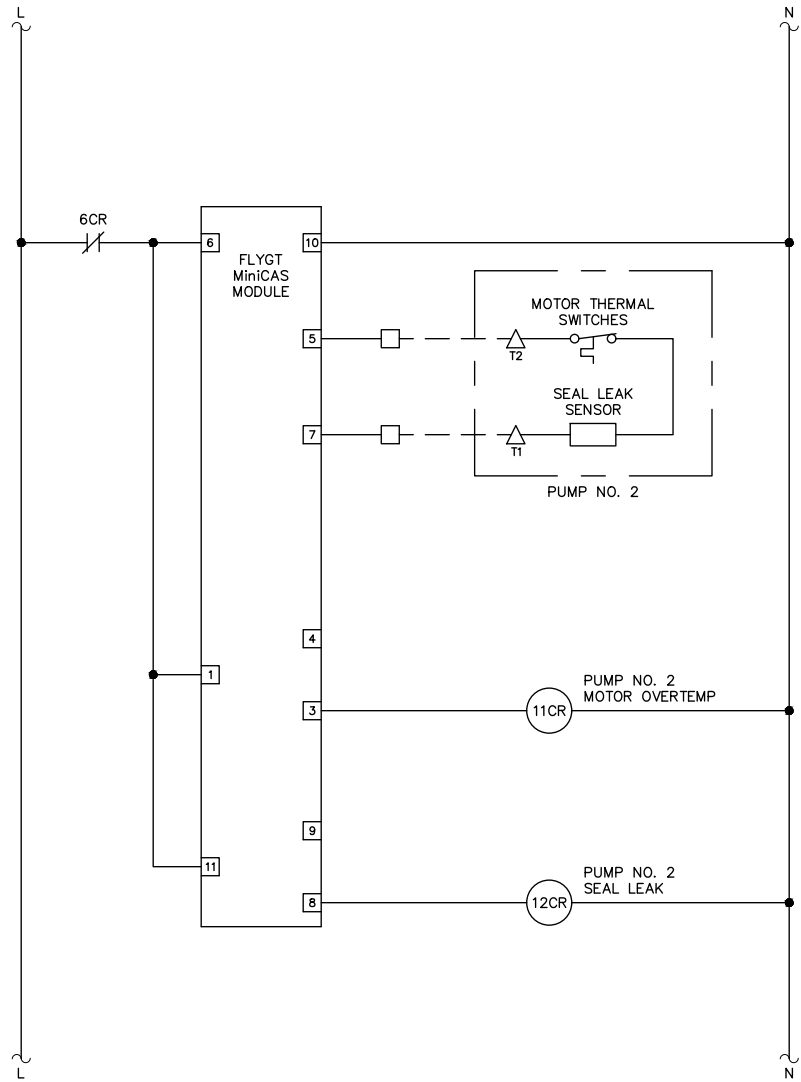
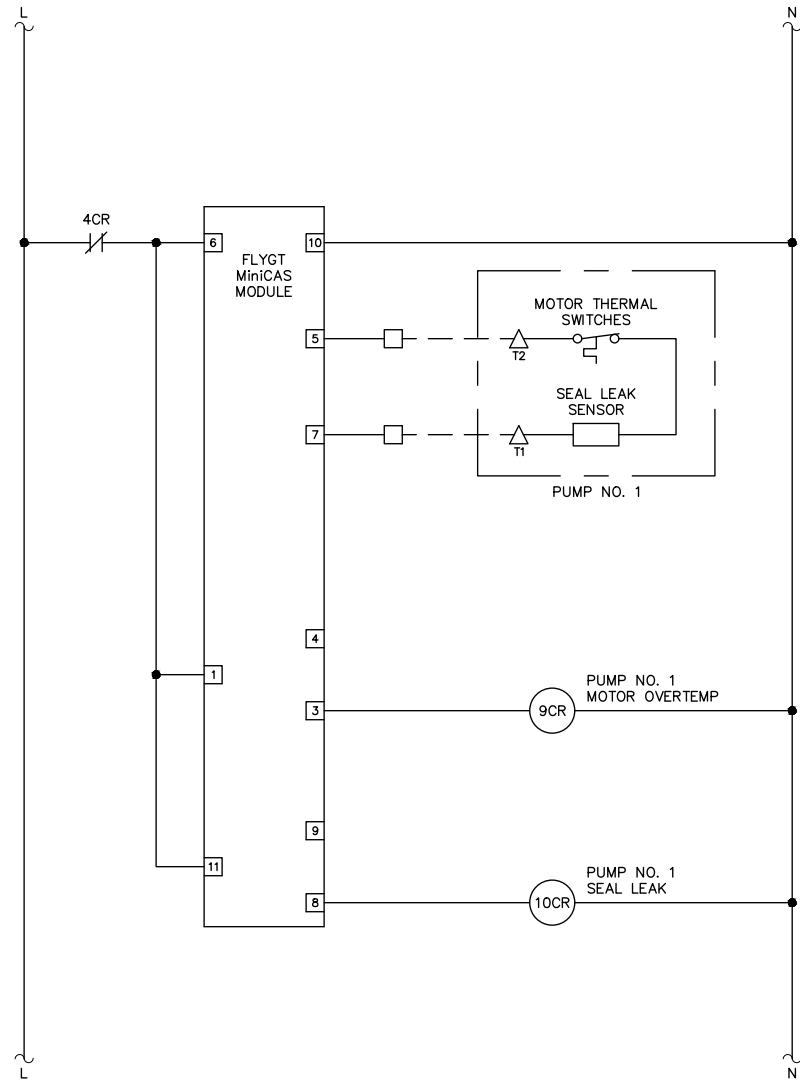
Page 66 of 290



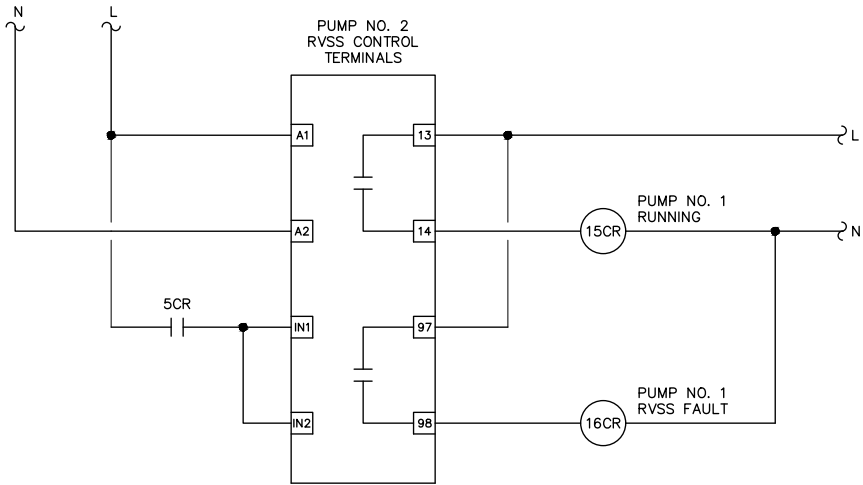
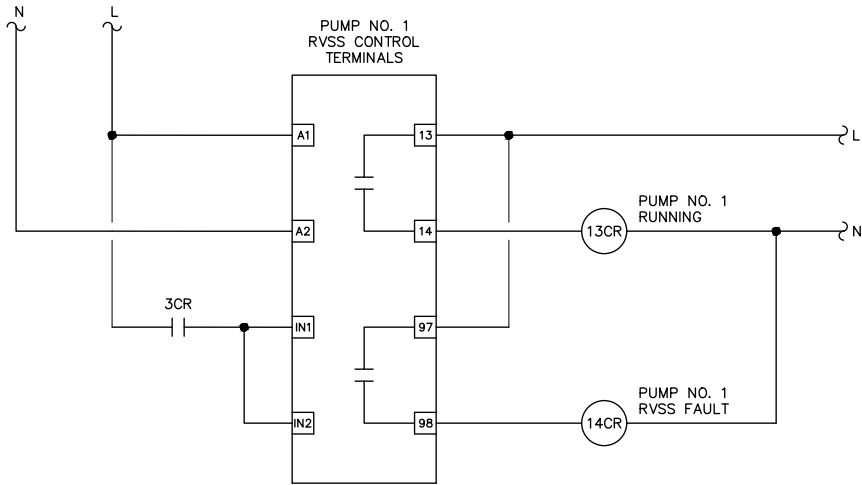
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DESIGN:	JAH	JASON A. HOYT, P.E.
DRAWN:	EBW	FL LICENSE NUMBER 101453
CHECKED:	JAH	DATE:

CITY OF ST. PETE BEACH
PUMP & LIFT STATION
REHABILITATIONS
PID# PS26-401-608-00
PINELLAS COUNTY
FLORIDA

SHEET NUMBER
E-36

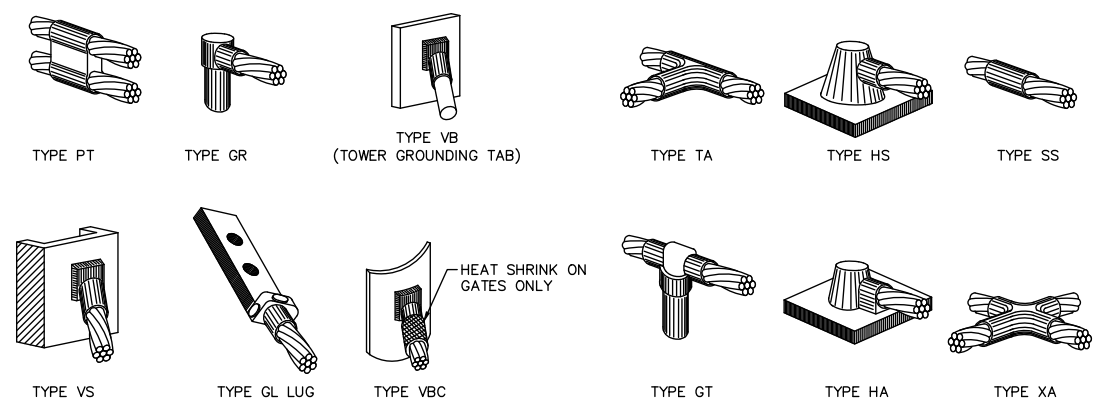


CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PUMP CONTROL PANEL WIRING DIAGRAM - RVSS		DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453 DATE:		Kimley»Horn © 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM REGISTRY NO. 35106		Revisions		By	
DATE: DECEMBER 2025		PROJECT NO. 148404108		SHEET NUMBER E-38		No.		Date		By	



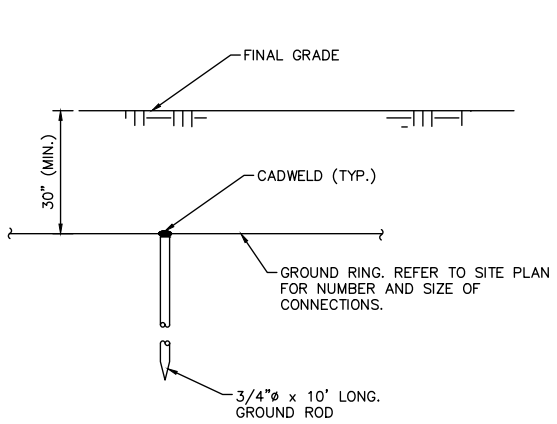
- GENERAL NOTES:
- REDUCED VOLTAGE SOFT STARTERS SHALL BE ALLEN BRADLEY SMC-3 WITH CONFORMAL COATED CIRCUIT BOARDS.

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PUMP CONTROL PANEL WIRING DIAGRAM - RVSS		DESIGN ENGINEER: JASON A. HOYT, P.E. FL LICENSE NUMBER 101453		Kimley»Horn		© 2025 KIMLEY-HORN AND ASSOCIATES, INC. 200 CENTRAL AVENUE, SUITE 600 ST. PETERSBURG, FL 33701 P: 727.547.3999 WWW.KIMLEY-HORN.COM		No.		Revisions		Date		By			
DATE: DECEMBER 2025		PROJECT NO. 148404108		SHEET NUMBER E-39		SCALE: AS NOTED		DESIGN: JAH		DRAWN: EBW		CHECKED: JAH		DATE:		PINELLAS COUNTY		FLORIDA	

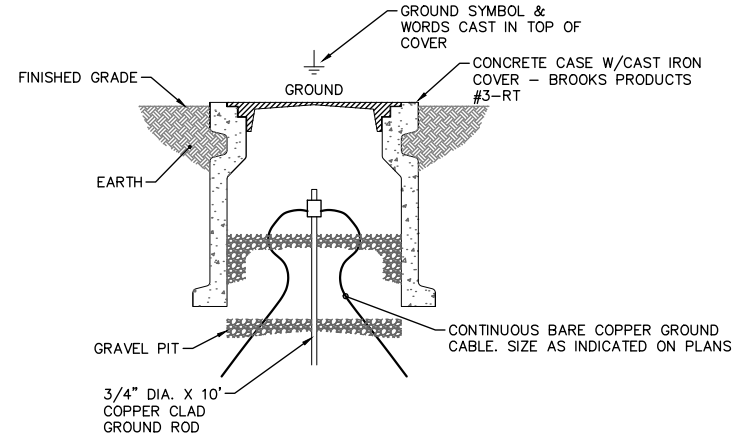


NOTES:
1. CADWELD "TYPES" SHOWN ABOVE ARE EXAMPLES. PROVIDE APPROPRIATE TYPES AS REQUIRED.

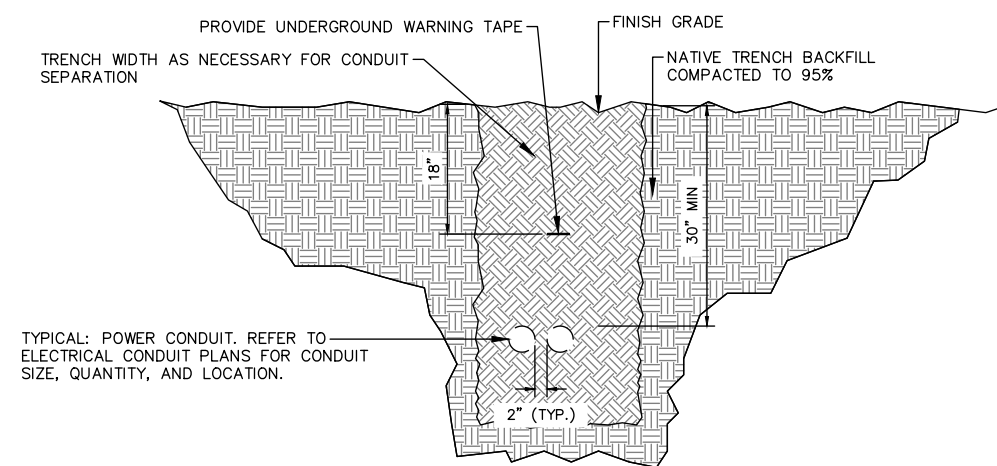
A TYPICAL CAD WELD DETAILS
SCALE: NO SCALE



B GROUND ROD DETAIL
SCALE: NO SCALE



C GROUND TEST WELL DETAIL
SCALE: NO SCALE



D TRENCH DETAIL
SCALE: NO SCALE

No.	Revisions	Date	By

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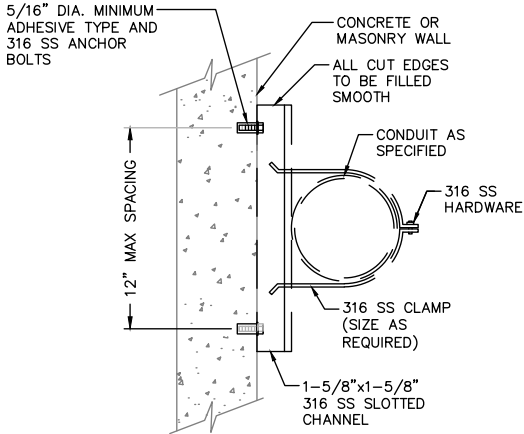
DESIGN ENGINEER:
JASON A. HOYT, P.E.
FL LICENSE NUMBER
101453
DATE:

SCALE:	AS NOTED
DESIGN:	JAH
DRAWN:	EBW
CHECKED:	JAH

ELECTRICAL DETAILS

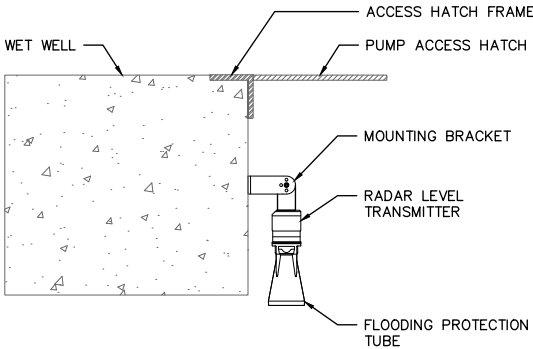
CITY OF ST. PETE BEACH
PUMP & LIFT STATION
REHABILITATIONS
PID# PS26-401-608-00
PINELLAS COUNTY
FLORIDA

DATE: DECEMBER 2025
PROJECT NO. 148404108
SHEET NUMBER E-40



- NOTES:
1. CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING THE CORRECT SIZE ANCHOR BOLTS BASED ON LOAD.
 2. FOR SINGLE CONDUITS 2" AND LARGER, USE SLOTTED CHANNEL AND ADHESIVE ANCHORS AS SHOWN.
 3. FOR SINGLE CONDUITS 1-1/2" AND SMALLER, SLOTTED CHANNEL MAY BE OMITTED AND USE OF NON-ADHESIVE ANCHORS ARE PERMITTED.

A WALL CONDUIT INSTALLATION DETAIL
SCALE: NO SCALE



B RADAR LEVEL TRANSMITTER
INSTALLATION DETAIL
SCALE: NO SCALE

CITY OF ST. PETE BEACH PUMP & LIFT STATION REHABILITATIONS PID# PS26-401-608-00		PINELLAS COUNTY		FLORIDA	
DATE: DECEMBER 2025		PROJECT NO. 148404108		SHEET NUMBER E-41	
DESIGN ENGINEER:		SCALE:		ELECTRICAL DETAILS	
JASON A. HOYT, P.E. FL LICENSE NUMBER 101453		AS NOTED DESIGN: JAH DRAWN: EBW CHECKED: JAH			
DATE:					
Kimley»Horn					
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REGISTRY NO. 35106					
No.					
Revisions					
Date					
By					

Lift Station No. 4 Project Background Conditional Use Permit Application

Project Goals:

- The primary purpose of the Lift Station 4 project is to rehabilitate flood-damaged infrastructure and install mitigation improvements associated with operational reliability and post-storm recovery.
- The proposed improvements are intended to protect critical electrical and communications infrastructure from flooding, improve operational reliability during utility outages, reduce emergency response costs, and improve the City's ability to remotely monitor, operate, and recover wastewater facilities during emergency conditions.
- The permanent backup generators provide power to critical control and communication systems, allowing continued monitoring and operational control during power outages.

Prioritization:

- Lift Station 4 serves the Pass-a-Grille neighborhood south of 22nd Avenue, including Fire Station 22, and receives flow from Lift Station 5.
- Currently, 50 percent of the City's critical wastewater lift stations have elevated electrical controls and permanent backup power.
 - Upon completion of this project, 100 percent of the City's critical wastewater lift stations will have these resiliency features, improving the City's ability to maintain wastewater service during and after major storm events.

Lessons Learned:

- One of the operational issues experienced after Hurricane Helene was flooding of electrical controls and communications equipment at multiple wastewater lift stations.
 - Rendered those facilities inoperable until temporary systems could be deployed.
 - 9 bypass pump systems deployed.
- During Hurricane Milton, utility power was lost at all 21 wastewater lift stations citywide.
 - 5 backup generators deployed.
- The proposed Lift Station 4 improvements were developed following operational issues identified during storm response and recovery activities.

Post Storm Recovery:

- Following the storms, the City expended over \$850,000 on emergency protective measures for the wastewater lift stations, including bypass pump systems, temporary control panels, portable generators, SCADA repairs, fuel, vac truck services, electrical repairs, and ongoing emergency operations and monitoring.
- The City's post-storm operations also identified operational and cost considerations associated with prolonged bypass pumping. Following the storms, the weekly rental cost for one bypass pump and fuel was approximately \$9,800, excluding City labor, overtime, monitoring, temporary controls, vac truck support, maintenance, and related emergency response costs.

Project Scope:

- The proposed flood mitigation improvements primarily consist of elevating the electrical control equipment above the flood elevation and enclosing the equipment within a six-foot privacy fence.
- The platform elevation was established above the applicable FEMA Base Flood Elevation to reduce the risk of flood damage to critical electrical equipment.
- The elevated platform and stairs are required to provide safe access to the controls for operations and maintenance activities.
- The elevated controls and enclosure are proposed regardless of whether a permanent generator is included.
- The proposed improvements are located near the existing lift station to minimize modifications to the existing wastewater collection system while maintaining reliable operation and facilitating ongoing maintenance.

Emergency Preparation:

- During project planning, alternatives including portable emergency generators and bypass pumping were evaluated.
 - Portable generators can provide temporary backup power during utility outages; however, they do not address flood damage to electrical controls and communications equipment.
 - If controls are submerged or otherwise damaged, bypass pumping becomes necessary to maintain wastewater operations until repairs or temporary controls can be installed.
- Utilities staff lower wet well levels before major storms as part of hurricane preparedness activities.
 - The timing and operational strategy for those activities are coordinated with downstream wastewater system operations at the South Pasadena booster station and the Northwest Water Reclamation Facility.
 - Lowering wet well levels provides temporary storage capacity within the wastewater collection system but does not eliminate the need for temporary or permanent post-storm operational measures if utility power or controls are lost.

Project Summary:

- The proposed Lift Station No. 4 improvements represent a long-term resiliency investment intended to protect critical wastewater infrastructure, improve emergency response capabilities, reduce post-storm recovery costs, and maintain reliable wastewater service during future storm events while minimizing impacts to the surrounding public property.
- Pump & Lift Stations Rehabilitation capital improvement project (CIP Project No. 3003): The construction services contract with Marolff Environmental for the rehabilitation of wastewater pump stations 2 and 3, lift stations 4, 5, 7, 10, 11, 12, 13, 14, 15, and stormwater lift station 35 was approved June 23, 2026, in the amount not to exceed \$2,950,000.

[See Next Page for Lift Station Service Area Exhibit]

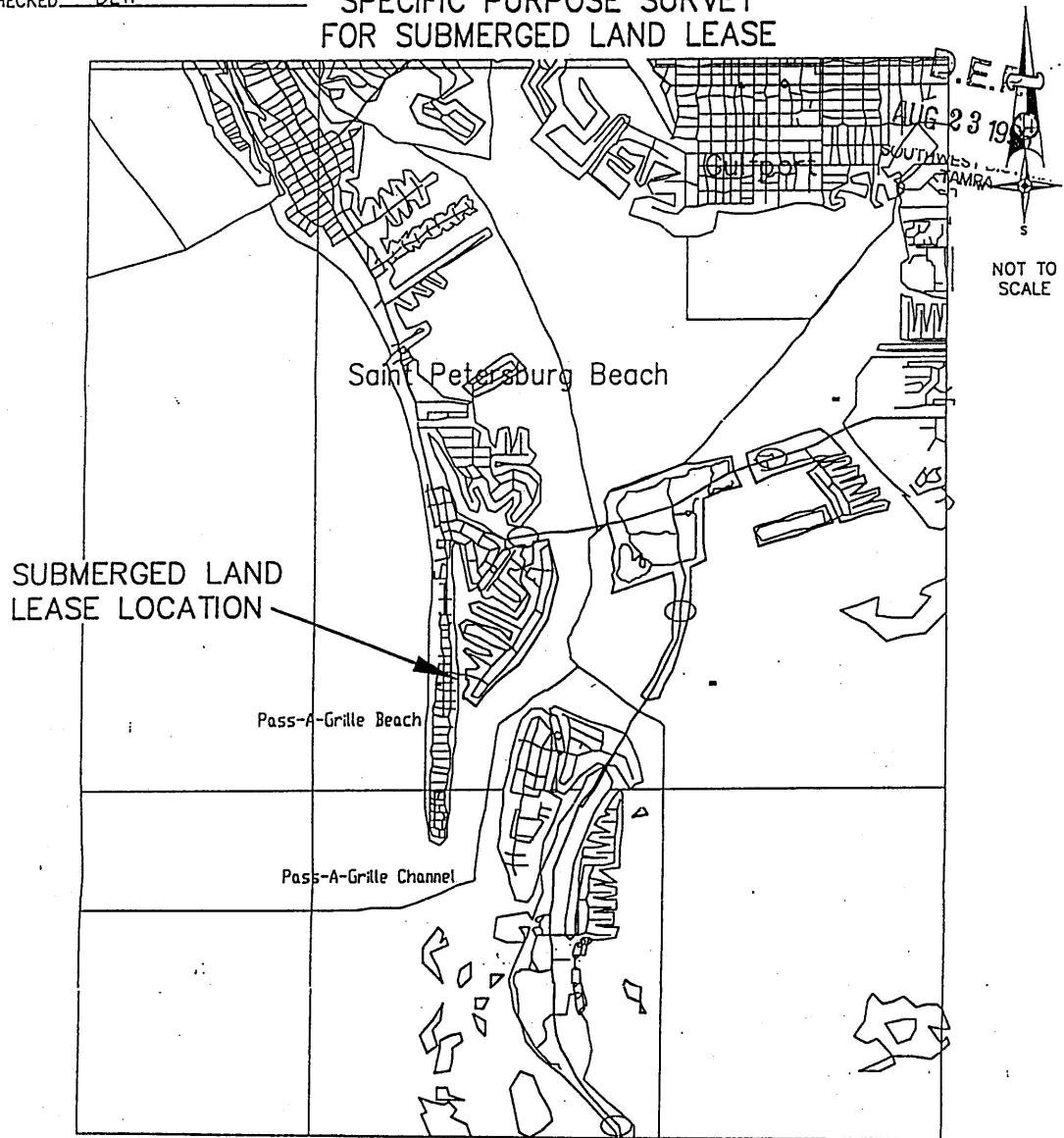
Lift Station 4 Service Area:



DRAWN GSN

CHECKED DLW

SEC. 18 TWP. 32 S., R. 16 E.

SPECIFIC PURPOSE SURVEY
FOR SUBMERGED LAND LEASE

U.S.G.S. QUAD -- PASS-A-GRILLE

LEGAL DESCRIPTION

FROM THE INTERSECTION OF THE EAST RIGHT OF WAY LINE OF PASS-A-GRILLE WAY AND THE SOUTH RIGHT OF WAY LINE OF 20TH AVENUE AS A POINT OF REFERENCE. THENCE EAST, ALONG SAID SOUTH RIGHT OF WAY, 116.04 FEET TO THE POINT OF BEGINNING. THENCE LEAVING SAID SOUTH RIGHT OF WAY LINE, $N00^{\circ}05'55''W$, 2.00 FEET, THENCE EAST 36.00 FEET, THENCE $N00^{\circ}05'55''W$, 33.00 FEET, THENCE EAST 82.30, THENCE $S00^{\circ}05'55''E$, 264.00 FEET, THENCE WEST 120.00 FEET, THENCE $N00^{\circ}05'55''W$, 16.78 FEET, THENCE EAST 1.70 FEET, THENCE $N00^{\circ}05'55''W$, 212.22 FEET TO A POINT ON THE ABOVE SAID SOUTH RIGHT OF WAY LINE AND THE POINT OF BEGINNING.

CONTAINING 30072 SQUARE FEET OR 0.69 ACRES MORE OR LESS.

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Page 7 of 14 Pages
SSLL No. 523011023

SHEET 1 OF 2



George F. Young, Inc.

ARCHITECTURE • ENGINEERING • ENVIRONMENTAL • LANDSCAPE ARCHITECTURE • PLANNING • SURVEYING

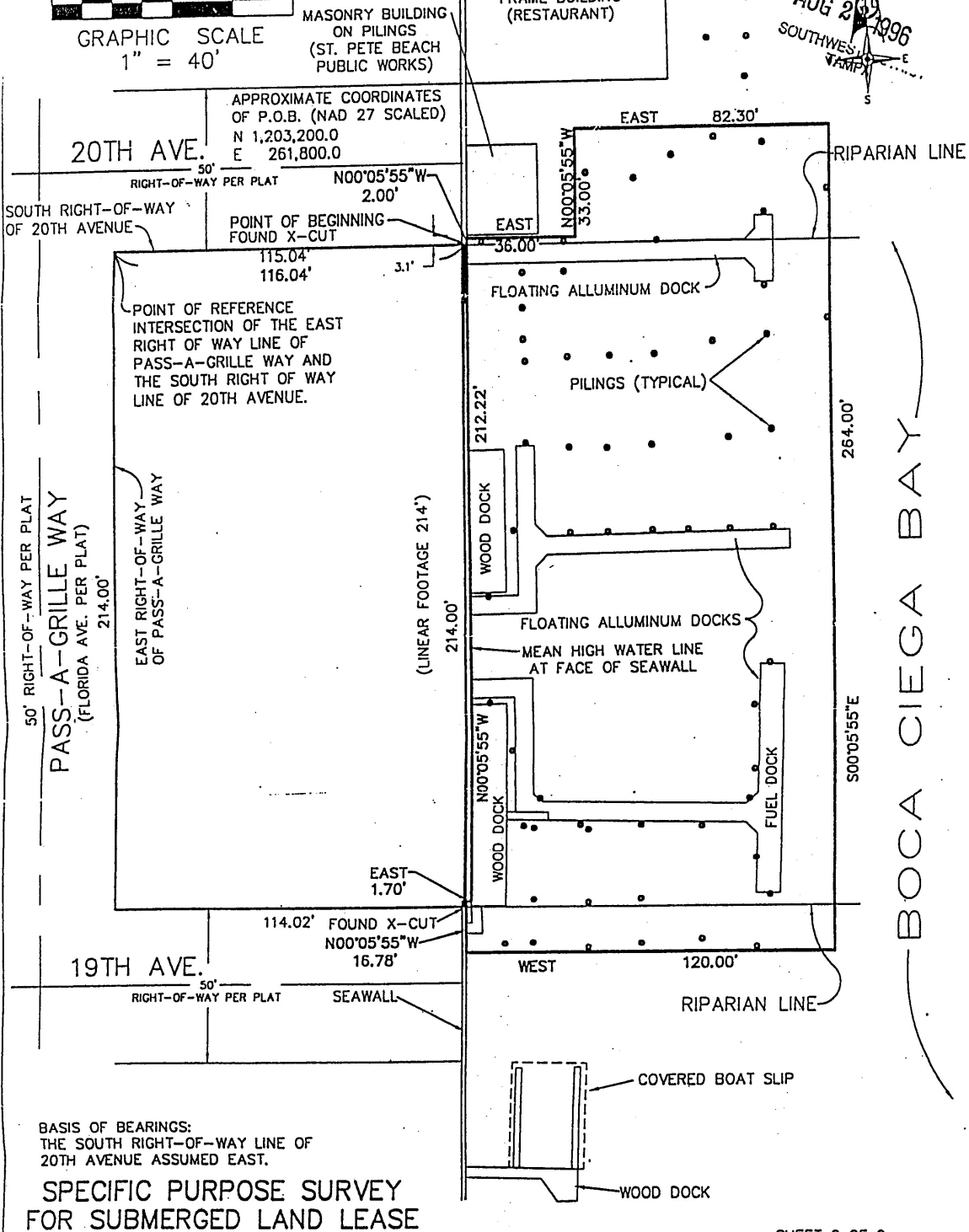
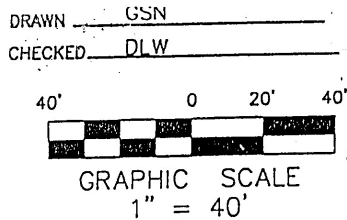
☐ ST. PETERSBURG	299 9th St. N., St. Petersburg, FL 33701	(813)-822-4317
☐ TAMPA	2906 N. Florida Ave., Tampa, FL 33602	(813)-223-1747
☐ NEW PORT RICHEY	8520 Government Dr., Suite 1, New Port Richey, FL 34654	(813)-785-6716
☐ BRADENTON	381 6th Ave. W., Bradenton, FL 34205	(813)-745-2377
☐ GAINESVILLE	3131 NW 13th St., Gainesville, FL 32609-2183	(904)-378-1444

SEE SHEET 2 OF 2 FOR
SKETCH AND NOTES.

SURVEY FOR PASS-A-GRILLE
NAME MARINA
ORDER NO. 96-13-0692-00
DATE 7/1/96

I HEREBY CERTIFY THAT THE SURVEY REPRESENTED
HEREON MEETS THE MINIMUM REQUIREMENTS OF
61G17-6, FLORIDA ADMINISTRATIVE CODE, AS
PERTAINING TO SPECIFIC PURPOSE SURVEYS. UNLESS
IT BEARS THE SIGNATURE AND THE ORIGINAL SEAL OF
A FLORIDA LICENSED SURVEYOR AND MAPPER THIS
DRAWING, SKETCH, PLAT OR MAP IS FOR
INFORMATIONAL PURPOSES ONLY AND IS NOT VALID.

David L. Wimpey
DAVID L. WIMPEY, P.E. & M.
Florida Surveyor's Reg'n. No. 3603
SURVEY NOT VALID UNLESS SIGNED
AND EMBOSSED WITH A SEAL.



BASIS OF BEARINGS:
THE SOUTH RIGHT-OF-WAY LINE OF
20TH AVENUE ASSUMED EAST.

**SPECIFIC PURPOSE SURVEY
FOR SUBMERGED LAND LEASE**

SHEET 2 OF 2



George F. Young, Inc.

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□ GAINESVILLE	3131 NW 13th St., Gainesville, FL 32609-2183	(904)-378-1444

SEE SHEET 1 OF 2 FOR LEGAL
DESCRIPTION AND CERTIFICATION.

SURVEY FOR
NAME PASS-A-GRILLE
MARINA
ORDER NO. 96-13-0692-00
DATE 7/1/96

Attachment A
Page 8 of 14 Pages
SSLL No. 523011023

CONTRACT DOCUMENTS
TECHNICAL SPECIFICATIONS



CITY OF ST. PETE BEACH

PROJECT NAME:
Pump & Lift Station Rehabilitations
PID# PS26-401-608-00

PROJECT NUMBER:
148404108

DATE ISSUED:
December 2025

PROJECT OWNER:

City of St. Pete Beach
c/o Public Works Department
7581 Boca Ciega Dr
St. Pete Beach, Florida 33706
727-363-9254

PREPARED BY:

Kimley-Horn and Associates
200 Central Avenue, Suite 600
St. Petersburg, Florida 33701
727-547-3999
Registry No. 35106

KYLE T. MATHENY, P.E.
License No. 97287

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St. Petersburg, Florida 33701
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Pump & Lift Station Rehabilitations
PID# PS26-401-608-00**

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SECTION 1 - GENERAL

1.01 LOCATION OF THE WORK SITE AND ACCESS

Access to the work sites shall be over streets, and walkways. Any damage to existing pavement surface and base or other surface improvements outside the Contract Pay Limits, attributable to the Contractor's activities, shall be restored to like-new condition by the Contractor at the Contractor's expense.

The nearest addresses for the lift station rehabilitations are shown below:

<u>Lift Station #</u>	<u>Nearest Address:</u>
LS #4	1901 Pass-a-Grille Way, St. Pete Beach, FL 33706
LS #5	600 Pass-a-Grille Way, St. Pete Beach, FL 33706
LS #9	1360 Boca Ciega Isle Drive, St. Pete Beach, FL 33706
LS #10	7398 Sunset Way, St. Pete Beach, FL 33706
LS #11	490 82 nd Avenue, St. Pete Beach, FL 33706
LS #12	401 93 rd Avenue, St. Pete Beach, FL 33706
LS #13	5411 Pali Way, St. Pete Beach, FL 33706
LS #14	500 64 th Avenue, St. Pete Beach, FL 33706
LS #15	650 56 th Avenue, St. Pete Beach, FL 33706
SW LS #35	208 Pass-a-Grille Way, St. Pete Beach, FL 33706

1.02 SCOPE OF WORK

The Contractor shall furnish all labor, superintendence, materials, power, light, heat, fuel, water, tools, appliances, equipment, supplies, shop drawings, working drawings and other means of construction necessary or proper for performing and completing the work. The Contractor is responsible for obtaining all required permits necessary for the work, including all applications and review fees, other than those permits which may have already been obtained. The Contractor shall perform and complete the work in a speedy and efficient manner consistent with safety of life and property and to the satisfaction of the City, and in strict accordance with the Contract Documents. The Contractor shall repair or restore all structures and property damaged or disturbed during performance of the work.

The cost of incidental work described in this General Section, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made.

The Contractor shall be solely responsible for the means and methods of construction and the adequacy of his workmanship, materials and equipment.



1.03 PROJECT SUMMARY

The Contractor shall furnish all labor, material, equipment and incidentals necessary for rehabilitation of lift stations #4, 5, 9, 10, 11, 12, 13, 14, 15, and storm water lift station 35 including, but not limited to, temporary by-pass pumping, dewatering, gravity main connections, testing, site restoration, maintenance of traffic, and construction of elevated platforms including site fencing and access gates, water services, gravity main, manholes, air release valves, and appurtenances, pump replacement, cleaning of existing valve vaults and wet wells, and lift station control panel replacements. The work shall also include furnishing all labor, material, and equipment necessary for site restoration including but not limited to fill replacement, landscaping, irrigation, grading, clearing and grubbing, pavement repair and replacement, pavement striping, and concrete curb installation.

1.04 CONTRACT DRAWINGS AND SPECIFICATIONS

Where the Contract Drawings and Specifications are not in agreement, the Contract Drawings shall govern. The Contractor shall furnish all labor, equipment, and materials to construct the Project and all miscellaneous and appurtenant work complete in place as specifically described and included under said each Contract Pay Item as shown, specified, or directed by the Engineer in accordance with the obvious or expressed intent of the Contract.

The Technical Specifications for the Project that reference FDOT-SSRBC (Florida Department of Transportation - Standard Specifications for Road and Bridge Construction) pertain to the most recent edition at the date of issuance of these Specifications.

1.04.01 COPIES FURNISHED TO CONTRACTOR

The Contractor shall furnish each of the subcontractors, manufacturers, and material men such copies of the Contract Documents as may be required for their work. Additional copies of the Contract Drawings and Specifications, when requested, may be furnished to the Contractor at cost of reproduction.

1.04.02 SUPPLEMENTARY DRAWINGS

When, in the opinion of the City, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the Engineer and the City and provided to the Contractor.

1.04.03 CONTRACTOR TO CHECK CONTRACT DRAWINGS AND DATA

The Contractor shall verify all dimensions, quantities and details shown on the Contract Drawings, Supplementary Drawings, Schedules, Specifications or other data received from the City or the Engineer and shall notify the City and Engineer of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at the Contractor's own expense. The Contractor shall assume



all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract with approval by the City.

1.05 FIELD ENGINEERING

The Contractor shall establish and provide all vertical and horizontal control points for this Project including benchmarks. The Contractor shall provide the field layout surveying necessary to properly construct the work as indicated on the Contract Drawings.

All field layout surveying shall be performed under the supervision of a Professional Land Surveyor (Chapter 472, Florida Statutes). The Contractor shall submit the name and registration number of Surveyor as directed by the Engineer. The Engineer reserves the right to check all survey staking and to require adjustments or re-staking by the Contractor in the event that conflicts, or errors are detected.

Water pressure pipelines that are 8-inch or less diameter shall be installed with the required cover using horizontal control stakes provided by the Contractor. Storm drains, sanitary sewers, sanitary pressure pipelines, and water pressure pipelines greater than 8-inch diameter shall be installed using an approved method for line and grade control. Methods for line and grade control shall be submitted to the Engineer for review and acceptance, as specified for shop drawings. Sketches shall be provided by the Contractor showing vertical adjustment necessary for pressure pipelines to adequately clear storm drains and other utilities, unless otherwise shown on the Contract Drawings.

1.06 SAFEGUARDING SURVEY MARKS

The Contractor shall safeguard all existing property monuments, benchmarks, and other survey marks adjacent to and within the Project limits and shall bear the cost of re-establishing them if disturbed or destroyed.

1.07 INSPECTION AUTHORITY

The City or Engineer has ultimate responsibility for contract administration and inspection for this Project. The City or Engineer may assign field inspection responsibilities to a Design Professional and/or City Inspector. Each step of construction is subject to review and acceptance by the City or Engineer prior to proceeding with a subsequent step.

During the progress of the Work and up to the date of final acceptance, the Contractor shall at all times afford representatives of the City, the County, the State, the Department of Environmental Protection, the Department of Transportation, the Department of Labor, or any other agency with jurisdiction, every reasonable, safe, and proper facility for observation of the work done or being done at the site, and also the manufacture or preparation of materials and equipment at the place of such manufacture or preparation.

The Project line of authority will be presented at the Preconstruction Conference.



1.08 PROJECT SCHEDULE

The Contractor shall submit an electronic version in PDF form within 30 days following the Preconstruction Conference.

Scheduling and progress reporting shall be accomplished using a bar chart to provide a clear and concise comparison of progress.

1.09 MATERIALS AND EQUIPMENT

All materials, appliances, and types of construction shall be in accordance with the Technical Specifications and shall, in no event, be less than that necessary to conform to the requirements of any applicable laws, ordinances, and codes.

All materials and equipment to be incorporated into the Work shall be new, unused, and correctly designed. They shall be of standard first grade quality, produced by expert workmen, and be intended for the use for which they are offered. Materials or equipment which, in the opinion of the Engineer, are inferior or of a lower grade than indicated, specified, or required, will not be accepted.

Projects funded by the State Revolving Fund must comply with the requirements of the American Iron and Steel Requirement unless otherwise specified in the Contract Documents and approved by the Engineer.

1.10 MANUFACTURER

The names of proposed manufacturers, manufacturers' representatives, suppliers, and dealers who are to furnish materials, equipment, or other fittings, shall be submitted by the Contractor to the Engineer for review and acceptance. Such acceptance must be obtained before Shop Drawings will be accepted for review. All transactions with the manufacturer and subcontractors shall be through the Contractor.

Any two or more pieces of material or equipment of the same kind, type, or classification and being used for identical types of service, shall be made by the same manufacturer.

Projects funded by the State Revolving Fund must comply with the requirements of the American Iron and Steel Requirement unless otherwise specified in the Contract Documents and approved by the Engineer.

1.11 SAMPLES

The Contractor shall, when required, submit to the Engineer for review and acceptance, typical samples of material and appliances. The samples shall be properly identified by tags and shall be submitted sufficiently in advance of the time when they are to be incorporated into the Work so that rejections thereof will not cause delay. A letter of transmittal from the Contractor requesting approval shall accompany all such samples.

1.12 EQUIVALENT QUALITY

In the Contract Documents, whenever an article, material, apparatus, equipment, or process is called for by trade name or by name of a patentee, manufacturer, or dealer, or by reference to



catalog of a manufacturer or dealer, it shall be understood as intending to mean and specify the article, material, apparatus, equipment, or process designated, or any equal thereto in quality, finish, design, efficiency, and durability, and equally serviceable for the purposes for which it is intended.

Whenever material or equipment is submitted for review as being equal to that specified, the submittal shall include sufficient information and data to demonstrate that the material or equipment conforms to the Contract requirements. The decision as to whether such material or equipment is equal to that specified shall be made by the Engineer.

Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Contract, the Contractor shall immediately proceed to furnish the designated material or equipment.

Neither the acceptance by the Engineer of alternate material or equipment as being equivalent to that specified, nor the furnishing of the material or equipment specified, shall in any way relieve the Contractor of responsibility for failure of the material or equipment, due to faulty design, material, or workmanship, to perform the functions required of them by the Contract Documents.

1.13 MATERIAL AND EQUIPMENT DELIVERY AND STORAGE

The Contractor shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the work to complete the work within the allotted time. The Contractor shall also coordinate deliveries to avoid delay in, or impediment of, the progress of the work of any related contractor. The Contractor shall provide space for storage of materials and equipment.

Pipe strung along roads and rights-of-way shall be placed in a manner that will not endanger or restrict pedestrian or vehicular traffic. Pipe strings shall not be allowed outside right-of-way limits.

1.14 SERVICE OF MANUFACTURER'S REPRESENTATIVE

The Contract amount shall include but is not limited to the cost of furnishing a competent and experienced representative of the equipment manufacturer who shall assist the Contractor, when required, to install, adjust, test, and place in operation the equipment in conformity with the Contract Documents. After the equipment is placed in operation, the representative shall make all adjustments and tests required by the Engineer to prove that the installed equipment is in proper and satisfactory operating condition. The representative shall instruct personnel as may be designated by the Engineer in the proper operation and maintenance of such equipment.

1.15 CONTAMINANTS CONTAINMENT/DISPOSITION

Prior to the installation of well points for dewatering, the Contractor shall visually inspect the work area for indications of existing ground water monitoring, wells, or metal caps at grade. The Contractor shall review the work area for monitoring wells or abandoned fuel tanks and shall notify the Engineer in writing if any of the above items exist.



During dewatering activities, contractor to test water for contaminants before discharge. If the water is odorous, contaminated, or discolored (excluding tannic acid or iron), the Contractor shall stop the dewatering activities and shall notify the Engineer in writing of such, and request direction.

When work activities encounter or expose any abnormal condition that may indicate the existence of a hazardous or toxic waste, work activities shall stop in the vicinity of the abnormal condition and the Contractor shall notify the Engineer immediately. The presence of tanks or barrels; discolored earth, metal, wood, or groundwater; visible fumes; abnormal odors; excessively hot earth; smoke; or other conditions that appear abnormal, may be signs of hazardous or toxic wastes and shall be treated with extraordinary caution.

Every effort shall be made by the Contractor to minimize the spread of any hazardous or toxic waste into uncontaminated areas.

The Contractor's operations shall not resume until directed in writing by the Engineer.

Disposition of the hazardous or toxic waste will be made in accordance with the requirements and regulations of any City, County, State, or Federal agency having jurisdiction.

1.16 PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION

The Contractor shall be responsible for prevention, control, and abatement of erosion, siltation, and water pollution resulting from construction of the Project until final acceptance of the Project.

The Contractor shall implement all appropriate turbidity management practices at the point of discharge into a storm sewer, gutter, or other conveyance to ensure that state water quality standards are not violated at the point where the storm drain, gutter, or other conveyance discharges into a surface water.

All necessary provisions shall be taken to ensure compliance with the water quality standards of the State of Florida. Attention is called to Chapter 62-302, Florida Administrative Code, and in particular, the requirements that turbidity shall not exceed 29 NTUs above background level. Adequate silt containment procedures and equipment shall be used to control turbidity, at no additional cost to the City.

1.17 MAINTENANCE OF STORM DRAINAGE SYSTEM

The Contractor shall be responsible at all times to maintain the operation of existing stormwater facilities, or, when existing stormwater facilities are removed, to provide equivalent capacity alternate forms of stormwater removal adequate to prevent upstream flooding in excess of existing conditions. This responsibility shall include but is not limited to the installation of temporary connections, bypass pumping, or other temporary means necessary until the new drainage system is fully operational.

1.18 SPILL OR DISCHARGE OF WASTEWATER OR RECLAIMED WATER

The discharge of wastewater or effluent (reclaimed water) into waters of the State and/or into canals, ditches, and ponds that are connected to waters of the State is prohibited. Any spill or



discharge of wastewater or reclaimed water shall be immediately reported to the Engineer, the City's Project Manager, and the City's Emergency Dispatch Center. Contact information will be provided for all necessary City personnel and the Engineer at the Preconstruction Conference. In the event of a spill or discharge, the Contractor shall immediately control, contain, and stop the spill or discharge and shall repair any damage to the City's facilities.

The Contractor shall be responsible for any penalties and costs charged to the City by the FDEP and for all costs incurred by the City as a result of the Contractor's actions or as a result of the Contractor's negligence. The fines, and anticipated costs, which may be incurred by the City as a result of the Contractor's actions or negligence, shall be paid to the City within 30 days, or the costs incurred will be deducted from the total Contract amount.

1.19 SEQUENCE OF OPERATION

1.19.01 PIPELINE WORK

It is the intent of the City that all pipeline work associated with the Project be installed to completion in a timely and orderly manner to minimize inconvenience to the Public. Pipe and pipe materials shall not be stored or strung in residential areas more than 3 weeks in advance of pipe installation unless otherwise approved by the Engineer.

The Contractor shall include in the Project Schedule a Sequence of Operations including, but not limited to, the following components:

- A. Pipe and pipe material storage
- B. Bypassing Pumping
- C. Backfilling
- D. Testing and repairs
- E. Surface Restoration and Cleanup

1.19.02 PUMP/LIFT STATION WORK

It is essential that any Project work conducted at Pump/Lift Station sites be sequenced to minimize obstruction of normal daily operations of the Pump/Lift Station.

The Contractor shall include in the Project Schedule a Sequence of Operations including, but not limited to, the following components:

- A. Equipment and material storage
- B. Bypassing Pumping
- C. Testing and repairs
- D. Surface Restoration and Cleanup

1.19.03 MISCELLANEOUS

Utility Companies may be present on the work site adjusting their facilities and installing new facilities. The Contractor's work shall be scheduled in such a manner as to minimize conflicts with various utility companies.



The Contractor shall clean up the site for each phase of work in accordance with the Contract Documents and confine work and personnel to designated areas in accordance with the Specifications. Before proceeding to a subsequent phase of work, unless otherwise approved by the Engineer.

1.19.04 NO TIME EXTENSION

If the Engineer orders construction, or a phase of construction, to be stopped due to the Contractor's neglect to adhere to the Sequence of Operations as outlined herein, the Stop Work Order shall not constitute a basis for extension of time.

1.20 WORK IN STREETS AND HIGHWAYS

All work within streets and highways shall be subject to the regulations and requirements of the City of St. Pete Beach, FDOT, and all other agencies with jurisdiction of the streets and highways in the work limits.

Methods and materials of construction used in restoration within such streets and highways shall conform to the requirements, inspection, and acceptance of the duly authorized representatives of the appropriate agency having jurisdiction. Restoration Work shall include but not be limited to: removal and replacement of pavement, sidewalk, curb, and gutter; replacement of storm sewer facilities; excavation and backfilling; and storage of materials and equipment.

1.21 WORK IN PRIVATE PROPERTY

The Contractor shall not trespass upon or in any way disturb private property without first obtaining written permission from the City to do so. In the event that, in the opinion of the Contractor, obtaining a temporary construction easement outside the limits of the right-of-way, of City-owned property, or of the easement(s) obtained by the City is necessary or desirable, it shall be the sole responsibility of the Contractor to obtain such easement from the owner of the property. If such easement is obtained by the Contractor, it shall contain provision to hold the City harmless from any operations of the Contractor within the easement limits. The Contractor shall not conduct construction operations on private property outside the limits of the right-of-way, of City-owned property, or of the easement(s) obtained by the City unless a copy of the Temporary Construction Easement Agreement is filed with the Engineer. It shall be the Contractor's responsibility to work equipment around poles, trees, or other obstructions and to do so at his own expense. The Contractor shall ensure all employees have a badge or visible identification during any time that they on the project site or within private property. This identification must be worn so that it is readily recognized and readable to the public.

Upon completion of work in easements, the Contractor shall, at no additional expense, restore the property, including all fences or other structures disturbed by his operations, to the full satisfaction of the City and shall obtain from the City a written release stating that restoration has been satisfactorily made. A copy of the completed written release shall be furnished to the City prior to payment. All items within the street right-of-way or sewer easement shall be removed, or removed and replaced, or restored as directed by the City.



1.22 PERMITS

Construction projects performed for the City will require licenses and permits in the same manner as private construction projects within the City.

The Contractor shall secure, at his expense, all licenses and permits, and shall comply with all applicable laws, regulations, and codes as required by the State of Florida and/or the City of St. Pete Beach whether performed by the Contractor or by others. The Contractor must be registered to complete such work within Pinellas County.

1.23 FIELD OFFICE AND APPURTENANT STRUCTURES

No field office or appurtenant structures by the Contractor, any subcontractor, or any material supplier, will be allowed on the Project site.

Space on City property or rights-of-way proposed to be used for storage and a field office for the Contractor shall be approved by the Engineer prior to installation providing such uses will not interfere in any manner with the construction of the work or the operation of existing facilities.

1.24 CONTRACTOR'S SIGN

No sign by the Contractor, any subcontractor, or any material supplier, will be allowed on the Project site.

1.25 MOBILIZATION

Mobilization shall include but is not limited to all preparatory work and operations necessary to begin the Project, including moving of personnel, equipment, traffic control, and all else necessary to commence work. The cost of bonds, insurance, shop drawings, and preconstruction expenses shall also be included.

If a separate Pay Item is included for mobilization, payment will be as specified for that Pay Item. If no Pay Item is included, costs for mobilization shall be included with the costs for the major Work items included in the Proposal.

1.26 WATER PURCHASE

Water used in connection with this Project must be coordinated with Pinellas County. Reclaimed water used in connection with this Project must be coordinated with the City.

1.27 TRAFFIC CONTROL

The Contractor shall provide required traffic controls under City observation. The Contractor shall notify the City's Project Manager a minimum of 2 working days prior to any construction affecting traffic flow. A Maintenance of Traffic plan drawing shall be submitted for review by the Engineer prior to each lane closure or opening during construction. All traffic control devices utilized during construction shall be provided by the Contractor and meet the requirements set forth in the latest revision of U.S. Department of Transportation Federal Highway Administration's "Manual on



Uniform Traffic Control Devices for Streets and Highways" and the Florida State Department of Transportation's "Standard Plans for Road and Bridge Construction." Failure or refusal, on the part of the Contractor, to install, maintain and/or position traffic control devices promptly, fully, and in an acceptable manner, shall be sufficient cause for the City, after 24-hour notice, to perform the traffic control with its own organization, or to contract with any other individual, firm, or corporation to perform the required traffic control. All costs and expenses incurred thereby shall be charged against the defaulting Contractor, and the amount thereof deducted from any money due, or which may become due him, or shall be charged against the Contract Bond. Any Work performed as described by this paragraph, shall not relieve the Contractor in any way of his responsibility for the Work performed by him.

Traffic shall be performed so that vehicular traffic shall be maintained on with at least one 10-foot wide lane in each direction at all times. An acceptable detour route shall be developed by the Contractor to redirect traffic when and where necessary, with the approval of the Transportation Special Events Division. Temporary lanes shall be constructed with a minimum 1-inch thick asphaltic concrete surface over a 6-inch thick limerock base compacted to 98% of the maximum density in accordance with AASHTO T-180.

Failure of the Contractor to comply with any of the above traffic control requirements may result in issuance of a stop work order until the violation is corrected.

All maintenance of traffic in the FDOT right-of-way shall be in accordance with FDOT requirements.

1.28 TREE PROTECTION

Particular care shall be taken by the Contractor to protect trees during construction by erecting approved barricades to prevent unnecessary damage to trunk and roots during construction. Such barriers shall protect the area within the dripline.

The Contractor shall prune all branches that interfere with construction in accordance with American Forestry Association Standards. Roots over 2-inch diameter shall be preserved wherever possible. If root pruning is required, roots shall be cut cleanly.

Temporary soil deposits, concrete block, concrete wash, or solvents shall not be placed within the dripline. The grade within the dripline shall be preserved. If adjacent grade is altered, protective measures such as those described in the Florida State Division of Forestry "Tree Protection Manual for Builders and Developers" shall be constructed to protect the tree(s) from deleterious effects of the grade change.

1.29 TREE REMOVAL AND REPLACEMENT

The Contractor shall obtain any necessary tree removal permit, shall furnish and replace trees as required, and shall perform this Work in a manner conforming to all applicable provisions of said regulations or permit.

The cost of tree removal and obtaining the tree removal permits shall be included in the cost of the appropriate associated Contract Pay Item under which the Work is to be performed. The Contractor shall remove trees as required and approved by the Engineer whether or not said trees are shown



on the Contract Drawings. Trees that must be removed, except for Australian pine, Brazilian pepper, punk, and other exempt species, shall be replaced as directed. Replacement trees shall be of native species at least 8-feet tall and at least 3-inch caliper diameter.

1.30 UTILITIES

Prior to construction, the Contractor shall familiarize himself with the location of all existing utilities and facilities within the Project Site. The Contractor must take the necessary precautions for the protection of any utility encountered on the Project or the restoration of any utility damaged during the work.

If excavation is required, The Contractor shall notify, at least 48 hours before breaking ground, all public or private service corporations having wire, poles, pipes, conduit, manholes, or other structures that may be affected by this operation, including all structures which are affected and not shown on these plans. Utility companies shall be contacted by calling the utility notification center "Sunshine 811" at 1-800-432-4770. Owners which are not members of the state's One Call service must be called directly. The City will furnish to the Contractor the available records of City utilities. The Contractor shall locate and mark all City utilities for his reference and for use by utility companies. The Contractor shall act as the City's agent for locating and marking City underground utilities within the Project limits, in accordance with the Florida Underground Facilities Damage Prevention and Safety Act (FS 556).

In all cases where existing utility lines may be interfered with by the work, the Contractor shall give a minimum of 48 hours' notice (excluding Saturdays, Sundays, and legal holidays) to the owners of such utilities to permit them to relocate the lines prior to construction. Existing utilities have been shown on the Contract Drawings insofar as information is reasonably available. However, it will be the Contractor's responsibility to preserve all existing utilities whether shown on the Contract Drawings or not. All maintenance, repair, and replacement of existing utilities shall be in accordance with the rules and regulations of the various utility companies having jurisdiction. All existing storm sewers, driveway drains, surface drainpipes and other property, removed or damaged during construction shall be repaired and reconnected by the Contractor as directed by the City at no additional cost to the City.

1.31 NEIGHBORHOOD NOTIFICATION

Not less than 7 days prior to the commencement of Work in the right-of-way, the Contractor shall notify all residents and businesses along the construction route with a printed door hanger notice indicating the scheduled date of construction, the type of construction, and the Contractor's and Superintendent's contact information. The door hanger text and a list of residents and businesses to which the notification has been delivered shall be compiled and submitted to the Engineer prior to the Contractor commencing Work.

1.32 SHOP, FIELD, AND LABORATORY TESTING

The Engineer may require testing by certified personnel of certain materials to be incorporated in the Work, such as: soils density, pavement, concrete pipe and appurtenances, and welds.

In the event any such testing is required by the Engineer; a detailed description will be found in



these Technical Specifications concerned with the specific item of Work.

Where reference is made for design mixes, tests of materials, or work performed, or where in the opinion of the Engineer, tests are required to ascertain compliance with the Specifications, the Contractor shall have such tests made by an approved testing laboratory. No additional payment will be made for these tests.

1.33 SALVAGED MATERIALS

The Contractor shall not proceed with demolition of existing materials or equipment without review and acceptance from the Engineer for the method of disposal.

All materials which are not returned to the City yard shall be disposed in an approved disposal site. The Engineer may request confirmation of the site's approval for disposal of the specific materials.

Salvaged materials shall be loaded on Contractor trucks and returned to the Public Services yard at 7581 Boca Ciega Drive, St. Pete Beach, Florida. The City will designate the specific location at the yard for placement of salvaged materials by the Contractor.

The following materials shall be removed and returned by the Contractor: pumps and pump rails, and all other materials as directed by the Engineer.

1.34 PRECONSTRUCTION VIDEO

The Contractor shall provide continuous color audio-video recording of the entire proposed work areas/construction areas prior to construction to serve as a record of pre-construction conditions. Audio-video recording must be supplemented with digital color photographs for areas which require details not ascertainable on the recording. The Preconstruction Video shall be delivered to the Engineer on nonreturnable USB compatible flash drives. The USB drive shall be new and thus shall not have been used for any previous recording.

The proposed work/construction area shall include, but not be limited to, all areas used for construction of the proposed improvements, temporary construction, stockpile areas, staging and storage areas, and entry and exit points used by equipment, delivery vehicles, service vehicles, and other vehicles used for transport of labor, equipment, and materials to the job site.

The preconstruction audio-video recording shall be of professional quality that will clearly log an accurate visual description of existing conditions. Any portion of the digital recording that is determined by the Owner or Engineer to be not acceptable in the documentation of the existing condition shall be re-filmed at no additional cost to the Owner.

The general requirements of the Preconstruction Video are as follows:

- A. The recordings shall contain coverage of all surface features located within the construction area and plus access routes used to reach the construction area. The recording shall include all surface conditions supported by appropriate audio description.



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- B. The surface features documented in the recordings shall include, but not be limited to, all driveways, sidewalk, curb, gutter, buildings, walls, storage sheds, swales, culverts, headwalls, landscaping, trees, shrubbery, pull boxes, valve boxes, concrete pads, power poles, mailboxes, and fences.
- C. The recordings shall also document the existence or nonexistence of any faults, fractures, or defects, and existing man-made material such as debris, construction stockpiles, trash, and fuel containers.
- D. The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views and visual displays of all visible house and building addresses shall be utilized. In easements where the proposed construction location will not be readily apparent in the recorded video, highly visible yellow flags shall be placed in such a fashion as to clearly indicate the proposed centerline of construction.
- E. When video recording on private property, the Contractor shall give the Owner sufficient prior notice of such entry so that property owners may be advised of, and their permission obtained for, the Work.
- F. All video recording shall be done during regular business hours, unless otherwise specified by the private property owner or the Engineer. The Contractor shall enter and leave private property in a professional and orderly, workmanlike manner.
- G. Each video recording shall have a simultaneous recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the feature being shown in the video portion of the recording. The audio recording also shall be free from any conversations between the camera operator and any other production technicians.
- H. The total video recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project. The digital portion of the recording shall produce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of picture imperfection. The audio portion of the recording shall produce the commentary of the camera operator with proper volume, clarity, and be free from distortion. The recording system shall utilize EIA standard video and RGB compatible video.
- I. All video recordings shall be labeled and shall be properly identified by video number, Project title, and date(s) of the recording.
- J. Each video shall have a log of that video's contents. The log shall describe the various segments of coverage contained on that video in terms of the names of streets or easements, coverage beginning and end, directions of coverage, and video unit counter numbers.



1.35 SITE MANAGEMENT

The Contractor shall prepare and maintain site management logs throughout construction that documents completion of maintenance activities such as dust control, setup and MOT checks, street sweeping, etc. At a minimum, these logs shall include the date, action taken, approximate location (if the construction area changes through the duration of the project), time of day, and initials of staff involved. Dust control measures shall be recorded daily in the morning and afternoon, MOT shall be recorded daily in the morning, afternoon, and end of day, and street sweeping will be logged once per day.

Site management logs shall be submitted to the City and the Engineer on a bi-weekly basis unless otherwise requested, and in accordance with **Section 3** of these Technical Specifications.

END OF SECTION



SECTION 2 - PAY ITEM DESCRIPTIONS

2.01 SCOPE

The scope of this section of the Contract Documents is to further define the items included in each Pay Item in the Bid Form section of the Contract Documents. Payment will be made based on the specified items included in the description in this section for each Pay Item.

All contract prices included in the Bid Form section will be full compensation for all shop drawings, working drawings, labor, materials, tools, equipment, and incidentals necessary to complete the construction as shown on the Contract Drawings and/or as specified in the Contract Documents to be performed under this Contract. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in the manner set up for each item in this section of the Specifications. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this Contract.

2.02 ESTIMATED QUANTITIES

The quantities shown are approximate and are given only as a basis of calculation upon which the award of the Contract is to be made. The City does not assume any responsibility for the final quantities, nor shall the Contractor claim misunderstanding because of such estimate of quantities. Final payment will be made only for satisfactorily completed quantity of each item.

2.03 WORK OUTSIDE AUTHORIZED LIMITS

No payment will be made for work constructed outside the authorized limits of work.

2.04 MEASUREMENT STANDARDS

Unless otherwise specified for the particular items involved, all measurements of distance shall be taken horizontally or vertically.

2.05 AREA MEASUREMENTS

In the measurement of items to be paid for on the basis of area of finished work, the lengths and/or widths to be used in the calculations shall be the final dimensions measured along the surface of the completed work within the neat lines shown or designated.

2.06 LUMP SUM ITEMS

Where payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum items. Lump sum contracts shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum totals.



2.07 PAY ITEM DESCRIPTIONS

Separate payment will be made for the items of work described herein and listed on the Bid Form. Any related work not specifically listed but required for satisfactory completion of the work shall be considered to be included in the scope of the appropriate listed work items.

No separate payment will be made for the incidental items not included in the Pay Item descriptions. The cost to complete such work shall be included in the applicable Pay Item unit cost. Final payments shall not be requested by the Contractor or made by the City until as-built (record) drawings have been submitted and approved by the City. Incidental items include, but are not limited to:

1. Shop Drawings, Working Drawings.
2. Clearing, grubbing and grading except as hereinafter specified.
3. Trench excavation, including necessary pavement removal and rock removal, except as otherwise specified.
4. Dewatering and disposal of surplus water.
5. Structural fill, backfill, and grading.
6. Replacement of unpaved roadways, and shrubbery plots.
7. Foundation and borrow materials, except as hereinafter specified.
8. Testing and placing system in operation.
9. Any material and equipment required to be installed and utilized for the tests.
10. Pipe, structures, pavement replacement, driveways and/or appurtenances included within the limits of lump sum work, unless otherwise shown.
11. Maintaining the existing quality of service during construction.
12. Appurtenant work as required for a complete and operable system.
13. Seeding and hydro mulching.
14. As-built Record Drawings, clean up, and miscellaneous work.

PAY ITEM NO. 1 – MOBILIZATION

Mobilization shall be the preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of temporary offices, storage buildings, staging areas, maintaining traffic, safety equipment and first aid supplies, sanitary and other facilities, and installation of tree protection measures as required by the Contract Documents and applicable laws and regulations. The costs of submittals, bonds, required insurance, permits and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item. Demobilization shall be the work of removing temporary facilities from the site, cleanup and restoration. Mobilization/Demobilization shall be limited to a maximum of ten percent (10%) of the total Bid Price.



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Payment for mobilization/demobilization will be made on an incremental basis in accordance with the following:

Percent of Original Contract Amount:	Percent Allowable Payment of Mobilization/Demobilization Pay Item Price:
5	25
10	35
25	45
50	50
75	75
100	100

These payments will be subject to the standard retainage provided in the Contract. Payment of the retainage will be made after completion of the work and demobilization.

PAY ITEM NO. 2 – MAINTENANCE OF TRAFFIC

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for all maintenance of traffic, including coordination with the City and FDOT, and all equipment and labor necessary to comply with the FDOT Standard Plans Index 102 Series for Maintenance of Traffic.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 3 – EROSION AND SEDIMENT CONTROL

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for erosion and sediment control.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 4 – BYPASS PUMPING

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for all by-pass pumping. Cost includes all equipment and labor necessary to successfully bypass during construction in compliance with the Contract Documents.

Measurement for periodic payments for this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.



PAY ITEM NO. 5 – PROJECT RECORD DOCUMENTS (AS-BUILT DRAWINGS AND O&M MANUALS)

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for as-built record drawings or any other required certifications to put proposed system in service and operation and maintenance manuals for all proposed equipment. All items are subject to approval by the Engineer.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 6 – CLEANING EXISTING VALVE VAULT INCLUDING REMOVAL OF DEBRIS AND SAND BLASTING AND RECOATING OF EXISTING FITTINGS

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for cleaning of existing valve vault including the removal of any debris and sand blasting and recoating of existing fittings. Sand blasting and recoating existing fittings includes removal, cleaning, surface preparation, exterior coating, and reinstalling the fitting in accordance with the Construction Drawings and Specifications. Payment includes any and all items necessary to complete work and shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM – ELECTRICAL EQUIPMENT RACK

Payment for all work included in this Pay Item shall represent full compensation in accordance with the lump sum price bid for furnishing and installing the listed electrical equipment including stainless steel unistrut rack, electric meter in aluminum enclosure, main disconnect, automatic transfer switch, pump control panel including VFDs as shown, junction box, relocation of existing SCADA panel, conduit, wiring, ground ring, and connection to existing electrical service. This Bid Item shall also include installation of all control panel components, installing pump motor leads, testing of power and control wiring to each submersible pump, and all other materials and equipment necessary for a complete and fully operable system, including testing and start-up, as shown on the Contract Documents.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.



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PAY ITEM	DESCRIPTION	UNITS
7	ELECTRICAL EQUIPMENT RACK INCLUDING PUMP CONTROL PANEL (5 HP - 7.5 HP), METER, MAIN DISCONNECT, AUTOMATIC TRANSFER SWITCH, JUNCTION BOX, AND RELOCATION OF SCADA PANEL	LS
8	ELECTRICAL EQUIPMENT RACK INCLUDING PUMP CONTROL PANEL (12 HP WITH VFD), METER, MAIN DISCONNECT, AUTOMATIC TRANSFER SWITCH, JUNCTION BOX, AND RELOCATION OF SCADA PANEL	LS

PAY ITEM NO. 9 – ELEVATED PLATFORM

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum price for furnishing and installing the elevated platform as shown on the Contract Drawings and as described in the Specifications. This Bid Item shall include the foundation, top concrete slab, columns, beams, stairs, stairs slab, and aluminum railings, placed and installed as shown on the Contract Documents. This Bid Item includes steel reinforcement and all associated work. Payment shall represent full compensation for all labor, materials, and equipment for mixing, placing, forming, finishing, and curing of the concrete, any required excavation, including rock as necessary, bedding, backfill, compaction, dewatering, sheeting, testing, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 10 – BACKUP GENERATOR, ENCLOSURE, AND SUB-BASE FUEL TANK

Payment for all work included in this Bid Item will be made on a lump sum basis and will include the direct cost for furnishing and installing the backup diesel generator, enclosure, and sub-base fuel tank, in accordance with Construction Drawings and Specifications. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 11 – SITE LIGHTING

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum price for furnishing and installing site lighting as shown on the Contract Drawings and as described in the Specifications. This Bid Item shall include the lighting foundation, conduit, grounding wire, aluminum pole with hand hole, and LED site light placed and installed as shown on the Contract Documents. This Bid Item includes concrete reinforcement and all associated work. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.



Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 12 – 6 FEET TALL VINYL PRIVACY FENCE

Payment for all work included under this Pay Item will be made at the Contract unit bid per linear foot for the purchase and installation of the 6-foot vinyl privacy site fence in accordance with the Construction Drawings and Specifications. Payment includes any required excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, and any and all other items necessary to complete work. Measurement will be based on the actual number of linear footage of vinyl fence furnished, installed, and approved. Payment shall represent full compensation for all labor, materials, equipment, and incidental items necessary to complete the work.

PAY ITEM NO. 13 – 6 FEET TALL, 4 FEET WIDE VINYL PRIVACY ACCESS GATE

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for furnishing and installing of the 6 feet tall, 4 feet wide vinyl privacy access gate in accordance with the Construction Drawings. Payment includes any required excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, and any and all other items necessary to complete work.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 14 – CURB INSTALLATION

Payment for all work included under this Pay Item will be made at the Contract unit price bid per linear foot for furnishing and placing curb as shown on the Drawings and listed in the Bid Form. Measurement will be per actual number of linear feet of curbing installed. Payment shall represent full compensation for all labor, material and equipment for compacting subgrade, forming, furnishing, placing the concrete, and finishing as specified and all incidentals necessary for completion of this Pay Item, in accordance with Specifications.

PAY ITEM NO. 15 – POTABLE WATER SERVICE AND HOSE BIB RELOCATION

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for the proposed connection to existing water main, relocation of existing water service line including but not limited to excavation, including rock, dewatering, sheeting, bedding and backfill, compaction, testing, detectable warning tape, locator wire, and installation of the proposed hose bib assembly and piping, as shown in the Construction Drawings. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the



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approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

PAY ITEM NO. 16 – DEMOLITION

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for, including but not limited to the demolition of landscaping including trees, control panel, asphalt, manhole, curb, air release valve, concrete pad, air release valve cabinet, piping, and site fencing as shown on the contract documents. Payment includes disposal and any required excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, and any and all other items necessary to complete work. Any equipment in working condition shall be salvaged as requested by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM – ELECTRICAL I&C

Payment for all work included in this Pay Item shall represent full compensation in accordance with the lump sum price bid for furnishing and installing the listed pump control panel replacements including removal of the existing panel, installation of pump control panel with generator receptacle, modifications to the existing electrical equipment rack including but not limited to raceways, concrete posts, and concrete pad as necessary for the proposed pump control panel. This Bid Item shall include installation of all control panel components, installing conduit and pump motor leads, testing of power and control wiring to each submersible pump, and all other materials and equipment necessary for complete a complete a fully operable system, including testing and start-up, all as shown on the Contract Documents.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM	DESCRIPTION	UNITS
17	ELECTRICAL I&C (5 HP – 7.5 HP PUMP CONTROL PANEL REPLACEMENT)	LS
18	ELECTRICAL I&C (35 HP PUMP CONTROL PANEL REPLACEMENT, WITH SOFT STARTER)	LS



PAY ITEM NO. 19 – CLEAN WETWELL INCLUDING SAND/DEBRIS PUMP OUT

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for existing wet well cleaning. Existing wet wells shall be cleaned in accordance with the Construction Drawings. Payment includes any and all items necessary to complete work. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 20 – 2” S.S. AIR RELEASE VALVE (ABOVE GROUND)

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price for installation of a 2” stainless steel air release valve including air release valve body, concrete pad, underdrain, piping, valve, and connection to existing force main. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 21 – FORCE MAIN DETECTABLE WARNING TAPE

Payment for all work included in this Pay Item shall be made at the applicable Contract unit price bid per the schedule of prices for furnishing and installing force main detectable warning tape as shown in the Contract Documents and listed on the Bid Form.

Measurement and Payment shall be made for the actual length of detectable warning tape installed, approved, certified, and placed into operation and will represent full compensation for all labor, materials and equipment required to complete these Pay Items, including but not limited to excavation, including rock, dewatering, sheeting, bedding and backfill, compaction, coordination with other utilities that are disturbed during construction, protection of existing facilities and structures, and all other incidentals for complete installation. No additional compensation shall be made for excavation below the bottom of the pipe, rock removal, bedding and backfill material, or for repair of any trench settlement. No additional compensation shall be made for extensive dewatering.

PAY ITEM NO. 22 – 6 FEET TALL, 12 FEET WIDE VINYL PRIVACY DOUBLE GATE

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for the purchase and installation of the 12-foot vinyl double door swinging access gate in accordance with the Construction Drawings and Specifications. Payment includes any required excavation, including rock as necessary, bedding,



backfill, dewatering, sheeting, and any and all other items necessary to complete work.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

PAY ITEM NO. 23 – RECLAIMED WATER SERVICE AND HOSE BIB RELOCATION

Payment for all work included, but is not limited to, under this Pay Item shall represent full compensation in accordance with the lump sum price bid for the proposed connection to existing water main, relocation of existing water service line including but not limited to excavation, including rock, dewatering, sheeting, bedding and backfill, compaction, testing, detectable warning tape, locator wire, and installation of the proposed hose bib assembly and piping, as shown in the Construction Drawings. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the City.

Measurement for periodic payments of this lump sum Pay Item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

PAY ITEM NO. 24 – SHELL RESTORATION

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per cubic yard of shell restoration as listed on the Bid Form. Density for backfill compaction shall be 95% per AASHTO T-180 density. Measurement of restoration will be per the actual number of cubic yards installed. Contractor shall match existing shell/rock material. Payment shall represent full compensation for all labor, materials and equipment for compacting subgrade, furnishing and installing the shell/rock, including all incidentals necessary to complete the restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the City.

END OF SECTION



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SECTION 3 - SUBMITTALS

3.01 GENERAL

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, drawings, setting drawings, 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.

Data on materials and equipment shall include, without limitation, materials and equipment lists, catalog 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. Submittal distribution will be by electronic submittal as coordinated during the Preconstruction Conference.

3.02 CONTRACTOR RESPONSIBILITIES

The Contractor shall submit to the City and Engineer for review and acceptance: working drawings, shop drawings, test reports and data on materials and equipment, and material samples (hereinafter in this section 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.

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

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 of executing the work in accordance with the Contract, even though such drawings have been reviewed.

For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

All manufacturers or equipment suppliers who proposed to furnish equipment or products shall submit an installation list to the City along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and have been in operation for a period of at least one (1) year.

No materials or equipment shall be ordered, fabricated or shipped or any work performed until the Engineer reviews and returns to the Contractor the submittals as acceptable according to the



submittal review codes in Section 3.04.

3.03 SUBMITTAL NUMBERING

When submitting shop drawings or samples, utilize a unique numbering system of the Contractor's choice. Subsequent resubmittals of a revised submittal shall be denoted with a letter, A-Z, indicating the resubmission of the same drawing (i.e. A=2nd submission, B=3rd submission, C=4th submission, etc.).

An example of a submittal numbering would be as follows: Submittal No. 5A - HDPE Pipe 6.03

1. 5A is the second submission of the 5th shop drawing submitted for the project
2. HDPE Pipe is the subject of the submittal
3. 6.03 is the Specification Section for HDPE Pressure Pipe

3.04 SUBMITTAL REVIEW

Submittals shall be transmitted in sufficient time to allow the Engineer at least twenty (20) working days for review and processing. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. An acceptance of a submittal shall be interpreted to mean that the Engineer has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications. This is not to be construed as permitting any departure from the Contract requirements, relieving the Contractor of responsibility for any errors, including details, dimensions, and materials, or approving departures from details furnished by the City, except as otherwise provided herein.

Submittals will be returned to the Contractor under one (1) of the following codes:

- A. "NO EXCEPTIONS TAKEN" is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.
- B. "CORRECTIONS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
- C. "REVISE AND RESUBMIT". This code is assigned when notations and comments are extensive enough to require a resubmittal of the package. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Engineer within 15 Calendar Days of the date of the Engineer's transmittal requiring the resubmittal.
- D. "REJECTED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.
- E. "Filed as Received" is assigned when the submittal is for informational purposes only. No review or comments will be provided by the Engineer.

END OF SECTION



SECTION 4 – AS-BUILT DRAWINGS

4.01 MINIMUM AS-BUILT DRAWING STANDARDS FOR ALL AS-BUILT DRAWINGS

For all elements of construction, As-Built Drawings shall be submitted to at least the level of detail in the contract documents. It is anticipated that the original contract documents shall serve as at least a background for all record information. Original drawings in CAD format may be requested by the City.

Project data points shall contain both horizontal and vertical data relative to the FL Florida State Plane, West Zone, US Foot. Vertical datum is NAVD 1983. All elevations shall be in feet and inches, referenced to NAVD 1988. Each sheet of the As-Built Drawings shall have the title “AS-BUILT DRAWING” printed in large bold lettering near the title block and a date corresponding to the date the as-built drawing was issued. As-Built Drawings notes, and information shall be bold or italics to identify them as As-Built information.

4.02 AS-BUILT DRAWINGS PREPARATION

The As-Built Drawings shall show the name, address, and phone number of the Contractor. Each drawing shall be certified by a responsible representative of the Contractor and dated. As-built information shall be recorded currently with construction progress and work shall not be concealed until required information is recorded. Properly prepared As-Built Drawings shall be certified by a Professional Engineer or Surveyor registered to the state of Florida, employed by the Contractor.

The As-Built Drawings shall at a minimum legibly include the following:

- A. All underground piping with elevations and dimensions. Changes to piping location. Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements. Actual installed pipe material, size, class, etc.
- B. Locations of drainage ditches, swales, water lines and force mains shall be shown every 200 feet (measured along the centerline). Dimensions at these locations shall indicate distance from centerline of right-of-way to the facility.
- C. All horizontal locations, if not in the right-of-way, must relate to easement.
- D. Field changes of dimension and detail.
- E. Changes made by Field Order or by Change Order.
- F. Details not on original Contract Drawings.
- G. Equipment and piping relocations.
- H. Locations of all valves, air release valves, fire hydrants, manholes, water and sewer services, water and force main fittings, underdrain cleanouts, catch basins, junction boxes and any other structures located in the right-of-way or easement, shall be located by



elevation and by station and offset based on intersection P.I.'s and centerline of right-of-way. For facilities located on private roads, the dimensioning shall be from centerline of paving or another readily visible baseline.

- I. Elevations shall be provided for all manhole rim and inverts; junction box rim and inverts; catch basin rim and inverts; and baffle, weir and invert elevations in control structures. Elevations shall also be provided at the PVI's and at every other lot line or 200 feet, whichever is less, of drainage swales and ditches. Benchmarks and elevation datum shall be indicated.
- J. Slopes for pipes and ditches shall be recalculated, based on actual field measured distances, elevations, pipe sizes, and type shown. Cross section of drainage ditches and swales shall be verified.
- K. Centerline of roads shall be tied to right-of-way lines. Elevation of roadway centerline shall be given at PVI's and at all intersections.
- L. As-Built Drawings shall show bearings and distances for all right-of-way and easement lines, and property corners.
- M. Sidewalks, fences, and walls, if installed at the time of initial as-built drawing submittal, shall be located every 200 feet or alternate lot lines, whichever is closer. Dimensions shall include distance from the right-of-way line and the back of curb and lot line or easement line.
- N. Allowable tolerance shall be ± 6.0 inches for horizontal dimensions. Vertical dimensions such as the difference in elevations between manhole inverts shall have an allowable tolerance of $\pm 1/8$ inch per 50 feet (or part thereof) of horizontal distance up to a maximum tolerance of ± 2 inch.

Specifications and Addenda shall be legibly marked to record manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed and changes made by Field Order or by Change Order.

4.02.01 REQUIREMENTS FOR RECLAIMED WATER MAINS AND FORCE MAINS

In addition to that specified above, the following information shall be provided on the As-Built Drawings.

- A. Location (vertical and any horizontal) at intervals not to exceed two hundred (200) feet and at all locations where the direction changes by more than ten (10) degrees.
- B. Pipe size, material, and dimension ratio.
- C. Location of air release valve.
- D. Detailed location of valves (horizontal).
- E. Elevations shall be provided on the top of operating nuts for all water and force main valves.



- F. Reclaimed water service connection location based on distance from main line and property line for each designed meter.
- G. Horizontal Directional Drilling (HDD) locations and elevations shall be shown on the As-Built Drawings. The beginning, ending, and surface locations shall be indicated as well as the horizontal and vertical location at least every 25 linear feet along the pipe as provided in the HDD Contractor's certified report and bore log.

All top of pipe elevations shall be accompanied by a finished grade elevation at the same location. Horizontal location of the pipe shall be defined using ties to back of curb and nearest property corner, property line or permanent control point.

4.02.02 REQUIREMENTS FOR GRAVITY SEWER

In addition to that specified above, the following information shall be provided on the As-Built Drawings.

- A. Manhole rim and invert elevations (include pipe inverts).
- B. Manhole horizontal location (i.e. dimension from right-of-way line or permanent control point.)
- C. Service laterals located from the nearest downstream manhole. These dimensions shall be provided by on-site inspections or televising of the sewer following installation.
- D. Distance between manholes.

Size and material of all pipe.

4.02.03 REQUIREMENTS FOR WASTEWATER PUMP/LIFT STATIONS

In addition to that specified above, the following information shall be provided on the As-Built Drawings.

- A. Location ties back to back of curb and nearest property corner or permanent control point.
- B. Wet well invert elevations.
- C. Pipe invert elevations.
- D. Valve vault inverts.
- E. Top of slab elevations.
- F. Pump make and model, horsepower, impellor size, design point.
- G. Operating set point elevations



4.03 AS-BUILT DRAWINGS SUBMITTAL

Prior to substantial completion and prior to starting the bacteria testing of water lines, Contractor shall deliver electronic As-Built Documents and As-Built Drawings to the City and the Engineer for review. If there are any required changes or additions, these shall be completed and resubmitted for review. Signed and sealed As-Built Documents and As-Built Drawings shall be submitted prior to final pay application to the City and the Engineer, both electronically and in hard copy paper format. Up to six (6) copies shall be provided at the City's request.

The Contractor shall employ a Professional Engineer or Surveyor registered in the State of Florida to verify survey data and properly prepare As-Built Drawings. As-Built Drawings shall be certified by the professional(s) (Engineer or Surveyor licensed in Florida), as stipulated by the Land Development Ordinance and submitted in electronic format and up to six (6) hardcopies signed and sealed by a Florida registered surveyor and mapper.

AutoCAD drawings shall be in DWG or DXF form. All fonts, line types, shape files, external references, or other pertinent information used in the drawing and not normally included in AutoCAD shall be included on the media with a text file or attached noted as to its relevance and use.

Accompany submittal with transmittal letter, containing:

- A. Date.
- B. Project title.
- C. Contractor's name and address.
- D. Title and number of each As-Built Document.
- E. Signature of Contractor or his authorized representative.

Note: The data required to properly prepare these As-Built Drawings shall be obtained at the site, at no cost to the City by the responsible design professional or his/her duly appointed representative. The appointed representative shall be a qualified employee of the responsible design professional or a qualified inspector retained by the responsible design professional on a project-by-project basis.

END OF SECTION



SECTION 5 - CONCRETE, MASONRY, AND REINFORCING STEEL

5.01 GENERAL

The Work in this section includes furnishing, placing, finishing, and curing all reinforced and plain concrete, prestressed concrete, reinforcing steel, welded wire fabric, brick, masonry block, mortar, and related work. Brick used for paving and hexagon block used for sidewalks are not included in this section.

5.02 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the applicable requirements of the FDOT-SSRBC Sections 346, 347, and 921.

Class IV concrete shall be used for all concrete in contact with, or over, salt or brackish water.

Concrete used for structures in contact with sewage shall be mixed from Type II Portland cement containing the lowest calcium thiosulfate available as specified in AASHTO M 85.

Concrete shall meet the following minimum 28-day compressive strength:

Miscellaneous concrete (thrust blocks, pipe encasement, etc.)	2,500 psi
Concrete curb/gutter/sidewalk/pavement	3,000 psi
Cast-in-place/precast structures	4,000 psi
Prestressed structures	5,000 psi

5.03 REINFORCING STEEL

Reinforcing steel shall conform to ASTM A 615, Grade 60 deformed bars and to the applicable requirements of FDOT-SSRBC Sections 415 and 931.

Reinforcing steel shall not be coated, except as specifically specified on the Contract Drawings.

All welded wire fabric shall conform to ASTM A 497 (deformed) or ASTM A 185 (plain) and to the applicable requirements of FDOT-SSRBC Article 415-6.

5.04 FIBROUS CONCRETE REINFORCEMENT

Fibrous concrete reinforcement may be used, where shown or approved, in lieu of welded wire fabric for shrinkage and thermal contraction/expansion in concrete pavement, driveway, and sidewalk.

Fibrous concrete reinforcement shall conform to ASTM C 1116, ASTM C 94, and ASTM E 119-83.



Fibrous concrete reinforcement shall be 100 percent virgin polypropylene fibrillated material mixed with concrete at a minimum of 1.5 pounds per cubic yard of concrete.

5.05 PLACEMENT OF REINFORCEMENT

Reinforcing steel placement shall conform to the applicable requirements of FDOT-SSRBC Articles 350-7 and 415-5.

The following minimum concrete cover shall be provided for all reinforcement:

Concrete cast against and permanently exposed to earth	3-inch
Concrete exposed to earth or weather	
Primary reinforcement	2-inch
Stirrups, ties, and spirals	1 1/2-inch
Concrete deck slabs, top and bottom	
	2-inch
Concrete not exposed to earth or weather	
Primary reinforcement	1 1/2-inch
Stirrups, ties, and spirals	1-inch

For bundled bars, the minimum concrete cover shall be equal to the equivalent diameter of the bundle, but need not be greater than 2-inch, except against and permanently exposed to earth, in which case the minimum cover shall be 3-inch.

Minimum concrete cover shall be increased in corrosive environment areas.

5.06 PLACEMENT OF CONCRETE

Placement of Portland cement concrete shall conform to the applicable requirements of FDOT-SSRBC Article 400-7.

Unless specific permission is granted prior to each occurrence, no concrete shall be delivered to the job site before 7:30 a.m. or after 4:30 p.m. No concrete shall be placed until the reinforcing steel placement has been inspected and approved by the Engineer.

5.07 CURING OF CONCRETE

Curing of Portland cement concrete shall conform to the applicable requirements of FDOT-SSRBC Article 520-8.

5.08 FINISHING OF CONCRETE

Finishing of Portland cement concrete shall conform to the applicable requirements of FDOT-SSRBC Article 400-15.



5.09 CONCRETE BRICK

Concrete brick for use in drainage structures and where shown on the Contract Drawings shall be approximately 3 5/8-inch by 7 5/8-inch by 2 1/4-inch in size and shall conform to ASTM C 55, Grade N-II or S-II.

5.10 CLAY BRICK

Brick shall be sound, hard, and uniformly burned regular and uniform in shape and size or compact texture and conforming to ASTM C 32, "Specification for Sewer and Manhole Brick (Made from Clay or Shale) Grade MS or MM."

5.11 MASONRY BLOCK

Load bearing units shall be hollow or solid, as shown on the Contract Drawings, and shall conform to ASTM C 90, Type I, 8-inch by 16-inch or 4-inch by 16-inch nominal face dimension.

Non-load bearing units shall conform to ASTM C 129, Type I, 8-inch by 16-inch or 4-inch by 16-inch nominal face dimension.

Horizontal continuous joint reinforcement shall be provided at every other joint. Reinforcement shall be a minimum of #9 gage steel, Grade 50. Wire shall be hot-dip galvanized, conforming to ASTM A 153, Class B-2 (1.5 ounce per square foot of wire surface) for zinc coating after prefabrication into units. Mortar coverage shall be not less than 5/8-inch on joint faces exposed to exterior, and not less than 1/2-inch elsewhere.

5.12 MORTAR

Mortar shall consist of a mixture of cementitious materials, aggregate, and water. All proportions shall be by volume and/or weight. Masonry cement shall conform to ASTM C 91 and C 270. Fine aggregate and Portland cement shall conform to the applicable requirements of FDOT-SSRBC Sections 902 and 921 respectively. Mortar shall have a minimum compressive strength of 1,500 psi.

5.13 GROUT

Grout shall be identical to mortar in all respects.

END OF SECTION



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SECTION 5A – ALUMINUM GRATING AND STAIRS

5A.01 GENERAL

5A.01.01 Work Included

The work under this section includes fabrication and erection of various aluminum items including aluminum frames, bracing, stairs, gratings and supports.

5A.01.02 Quality Assurance

- A. Standards: Unless otherwise specified, all materials, workmanship and practices shall conform to the following Standards:
 - a. Florida Building Code, Current Edition
 - b. Aluminum Design Manual, Current Edition, by the Aluminum Association.
- B. Qualifications: Fabrication and erection shall be by a qualified fabricator and erector approved by the Engineer. Preparation of shop drawings shall not begin until the fabricator and erector have been approved.

5A.01.03 Regulatory Requirements

- A. Aluminum fabrication materials shall meet the requirements of the following ASTM Standards and Specifications, unless otherwise specified:
 - a. Aluminum (Extruded Shapes), 6061-T6 (Alum. alloy)
 - b. Aluminum (Extruded Pipe), 6061-T6 (Alum. alloy)
 - c. Aluminum Bar Structural, 6061-T6 (Alum. alloy)
 - d. Aluminum Grating, 6063-T6 (Alum. alloy)
 - e. Stainless Steel Bolts, Fasteners AISI, Type 316
 - f. Stainless Steel Plate and Sheet, Wire AISI, Type 316
 - g. Welding Rods for Aluminum, AWS D1.2 Spec. for Welding (Alum.)
- B. Comply with the provisions of the following standards except as otherwise shown or specified.
 - a. Aluminum Design Manual, Current Edition, Specification for Aluminum Structures.
 - b. ASTM B308 / B308M, Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles



- c. ASTM B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
- d. ASTM B429, Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
- e. AWS code for welding in building construction.

5A.01.04 Submittals

- A. Shop Drawings, signed and sealed by a Florida registered Professional Engineer, shall include descriptive information as required to fully describe the aluminum components to be erected. Shop Drawings shall conform to AA recommendations and specifications and shall show all holes, etc., required for other Work. Include complete details showing all members and their connections, anchor bolt layouts, schedules for fabrication procedures, and diagrams showing the sequence of erection. Submittals shall include, but not be limited to the following:
 - a. Complete Information and Dimensions
 - b. Sequences of Erection
 - c. Mill Certificates
 - d. Connection Calculations - Calculations, signed and sealed by a Florida registered professional engineer, shall include design assumptions, manual calculations, computer printouts, and any other information required to evaluate the connection designs. Fabrication shall not be approved until the submission has been approved. Submittals shall in accordance with the requirements set forth in Section 3.

5A.02 PRODUCTS

5A.02.01 Materials

- A. Standard Shapes, Bars & Plates:
 - a. ASTM B 209 - Alloy 6061-T6
 - b. ASTM B 308 - Alloy 6061-T6
- B. Standard Threaded Fasteners:
 - a. Nuts, bolts and washers shall be 316 stainless steel.
- C. Welding Electrodes: 4043 filler metal.



5A.02.02 ALUMINUM GRATING

- A. For 3-foot or less spans: 1-1/2 inch deep serrated I-bars (alloy 6063-T6) spaced at 1-3/16-inch center-to-center shall be capable of supporting at least 681 PSF uniform load with no more than 0.207-inch deflection and at least 1021 pounds per foot of width concentrated load at midspan with no more than 0.166-inch deflection. Grating shall have end plates so that all I-bars are supported on all sides of grating panel.
- B. For 4-foot or less spans: 1-1/2 inch deep serrated I-bars (alloy 6063-T6) spaced at 1-3/16-inch center-to-center shall be capable of supporting at least 383 PSF uniform load with no more than 0.369-inch deflection and at least 766 pounds per foot of width concentrated load at midspan with no more than 0.295-inch deflection. Grating shall have end plates so that all I-bars are supported on all sides of grating panel.
- C. For 5-foot or less spans: 2 inch deep serrated I-bars (alloy 6063-T6) spaced at 1-3/16-inch center-to-center shall be capable of supporting at least 429 PSF uniform load with no more than 0.436-inch deflection and at least 1339 pounds per foot of width concentrated load at midspan with no more than 0.312-inch deflection. Grating shall have end plates so that all I-bars are supported on all sides of grating panel.
- D. For 6-foot or less spans: 2-1/2 inch deep serrated I-bars (alloy 6063-T6) spaced at 1-3/16-inch centers shall be capable of supporting at least 460-pound uniform load at a deflection of no more than 0.506-inch and 1379 pounds of concentrated load at midspan with a deflection of no more than 0.405-inch. Grating shall have end plates so that all I-bars are supported on all sides of the grating panel.
- E. Gratings shall be fastened at 24-inch centers along each supported edge, with a minimum of four aluminum fasteners with stainless steel hardware per panel in accordance with the manufacturer's recommendations.
- F. Aluminum grating shall have a mil finish, acidic detergent cleaned.
- G. Band all grating openings.
- H. Grating spans in excess of 6 feet are not permitted. When the required spans exceed 6 feet, the Contractor shall provide intermediate aluminum supports subject to the Engineer's approval.
- I. Finishes: Where aluminum is in contact with dissimilar metals or concrete it shall be protected with two coats (8 mils/coat DFT) coal tar epoxy.
- J. Where the contact of dissimilar metals may cause electrolysis or where aluminum will contact concrete, mortar or plaster, the contact surface of the metals shall be separated using not less than one coat of Zinc chromate primer and one heavy coat of aluminum pigmented asphalt paint on each surface; or where deemed necessary by the Engineer, not less than one course of asphalt saturated cotton



fabric cemented to both metals with flashing cement, shall be used. Finished works shall be cleaned and excess cement removed.

5A.02.03 ALUMINUM STAIR TREADS

- A. Serrated I-bars (alloy 6063-T6) spaced at 1-3/16-inch center to center shall be capable of supporting at least 100 PSF uniform load with no more than 0.25-inch deflection and at least 200 pounds per foot of width concentrated load at midspan with no more than 0.25 inch deflection over a 3 foot span.
- B. Treads shall have anti-slip, cast abrasive safety nosings and shall have a mil finish, acidic detergent cleaned.
- C. Fasten treads to safely support rated live load capacity in accordance with manufacturer's recommendations.
- D. Isolate all aluminum from steel supports with neoprene gasket material.

5A.02.04 MISCELLANEOUS ALUMINUM FABRICATIONS

- A. Unless otherwise indicated on the drawings, aluminum sheet metal fabrications shall be welded and 1/4-inch thick, minimum. Fasteners, where required, shall be 316 SS.
- B. Miscellaneous aluminum shapes and plates shall be fabricated as shown. Furnish all miscellaneous aluminum shown, but not otherwise detailed. Structural shapes and extruded items shall conform to the detail dimensions on the Drawings within the tolerances published by the American Aluminum Association.

5A.03 EXECUTION

5A.03.01 FABRICATION

- A. Fabrication shall be in accordance with the specified standards. Splices not indicated on the drawings will not be permitted.
- B. Surface Treatment: Treatment is required where indicated on the drawings.
- C. All miscellaneous metal work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.
- D. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Steel accessories and connection to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fitting.
- E. Welded joints shall be rigid and continuously welded or spot welded as specified or shown. The face of welds shall be dressed flush and smooth. Exposed joints shall be close fitting and jointed where least conspicuous.



- F. Welding of parts shall be in accordance with the Standard Code of Arc and Gas Welding in Building Construction of the AWS and shall only be done where shown, specified, or permitted by the Owner. All welding shall be done only by welders certified as to their ability to perform welding in accordance with the requirements of the AWS Code. Component parts of built-up members to be welded shall be adequately supported and clamped or held by other adequate means to hold the parts in proper relation for welding.
- G. All aluminum finish exposed surfaces shall have manufacturer's standard mill finish.

5A.03.02 ERECTION

- A. Erection shall be in accordance with the specified standards and as indicated on the drawings.
- B. No painting required, unless otherwise noted.
- C. Welding: Welding of aluminum shall be performed by the Gas Metal Arc (MIG) or Gas Tungsten ARC (TIG) process, per AWS Welding handbook. All welding shall be performed by an AWS certified welder.

5A.03.03 PREPARATION

- A. Clean and strip primed steel and aluminum items to bare metal where site welding is required.

5A.03.04 INSTALLATION

- A. Install all furnished items embedded in concrete or other masonry. Items to be attached to concrete or masonry after such work is completed shall be installed in accordance with the details shown. All dimensions shall be verified at the site before fabrication is started.
- B. Where aluminum is embedded in concrete, apply a heavy coat of approved bitumastic troweling mastic in accordance with the manufacturer's instructions prior to installation.
- C. Where aluminum contacts masonry, concrete, or grout, coat the contact surface of the aluminum with one coat of zinc chromate primer and a heavy coat of bituminous paint.
- D. Where aluminum contacts a dissimilar metal, apply a heavy brush coat of zinc-chromate primer and provide a 1/32-inch neoprene gasket between the aluminum and the dissimilar metal.
- E. Install items plumb and level, accurately fitted, free from distortion or defects.
- F. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.



- G. Field weld components indicated on shop drawings.
- H. Perform field welding in accordance with AWS D1.2/D1.2M.
- I. Obtain Engineer approval prior to site cutting or making adjustments not scheduled.
- J. Verify that supports and anchors are correctly positioned.
- K. Verify that opening sizes and dimensional variations are acceptable to suit grading, railing, and stair tolerances.

5A.03.05 TOLERANCES

- A. Conform to ANSI/NAAMM MBG 531-00 for bar grating.
- B. Maximum space between sections: ¼ inch.
- C. Maximum variation from top surface plane of sections: ¼ inch.
- D. Perform cutting, drilling, flashing and fitting required for installation of metal fabrications. Set the work accurately, provide temporary bracing and anchors in formwork for items to be built into masonry and concrete. Field weld joints, do not shop weld because of size limitations.

END OF SECTION



SECTION 5B – PIPE AND TUBE RAILINGS

5A.01 GENERAL

5A.01.01 Coordination

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

5A.01.02 Action Submittals

- A. Product Data: For the following:
 - a. Manufacturer's product lines of mechanically connected railings.
 - b. Railing brackets.
 - c. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

5A.01.03 Information Submittals

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
- E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.
- F. Evaluation Reports: For post-installed anchors, from ICC-ES.



5A.01.04 Quality Assurance

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - a. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

5A.01.05 Delivery, Storage, and Handling

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

5A.01.06 Field Conditions

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

5A.02 PRODUCTS

5A.02.01 Performance Requirements

- A. Delegated Design: Engage a qualified professional engineer, to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - a. Handrails and Top Rails of Guards:
 - i. Uniform load of 50 lbf/ ft. applied in any direction.
 - ii. Concentrated load of 200 lbf applied in any direction.
 - iii. Uniform and concentrated loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - a. Temperature Change: 120 deg F ambient; 180 deg F, material surfaces.

5A.02.02 Metals, General

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.



5A.02.03 Aluminum

- A. Posts: 1.90-inch O.D., Schedule 80, Alloy 6063-T6, at 6-feet on center maximum. The railing height shall be as required to meet code, but not less than 42- inches.
- B. Rails: 1.90-inch O.D., Schedule 40, Alloy 6063-T6. The number and spacing of rails required shall be as required to meet Code, but not less than 3 for horizontal rails and 2 for inclined rails.
- C. Kick Plates: 1/4-inch by 4-inch continuous plate, Alloy 6063-T52. Kick plate supports and shape shall be at sufficient frequency and construction for the installed kick plates to be completely rigid.
- D. Base Plates: Alloy 6063-T52.
- E. Brackets: Fully welded construction to fasten posts to walkway stringers. Where brackets are attached inside the web of a channel and vertical posts are used, the handrail shall be attached to the posts with adjustable standoffs to allow the railing to be directly over channel flange.

5A.02.04 Fasteners

- A. General: Provide the following:
 - a. Aluminum Railings: Type 316 stainless-steel fasteners.
- B. Fasteners for Interconnecting Railing Components:
 - b. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
- C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.
 - c. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

5A.02.05 Miscellaneous Materials

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
 - a. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items and that which matches the existing railing on site.
- B. Nonshrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.



- C. Anchoring Cement: Factory-packaged, nonshrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 - b. Water-Resistant Product: provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

5A.02.06 Fabrication

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop-assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with welded connections unless otherwise indicated.
- H. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
- I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- J. Close exposed ends of railing members with prefabricated end fittings.
- K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.



- M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- N. Toe Boards: Provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

5A.02.07 Aluminum Finishes

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Clear Anodized Finish: AAMA 611, AA-M12C22A31.

5A.03 EXECUTION

5A.03.01 Installation, General

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - a. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - b. Set posts plumb within a tolerance of 1/16 inch in 3 feet .
 - c. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - a. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.



5A.03.02 Railing Connections

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

5A.03.03 Anchoring Posts

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.
- D. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - a. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.
- E. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

5A.03.04 Attaching Railings

- A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends or connected to railing ends using nonwelded connections.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.
- C. Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- D. Secure wall brackets and railing end flanges to building construction as follows:
 - a. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.



5A.03.05 Protection

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION



**Technical Specifications
Section 5B – Pipe and Tube Railings
Pump & Lift Station Rehabilitations
PID# PS26-401-608-00**

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SECTION 6 – EXCAVATION AND BACKFILL

6.01 GENERAL

The Work in this section includes furnishing all labor, materials, tools, and equipment for excavation and backfill of roadways, sidewalks, curbs, driveways, pipelines, and structures. The Work also includes removing and disposing of leftover material and furnishing and placing off-site fill.

Bidders shall examine the site of the Work, make their own additional soil borings and tests, and make their own determination of the character of materials and the conditions to be encountered on the Work; their Bid shall be based upon their own investigation.

6.02 TRENCH SAFETY

The Contractor shall be responsible for maintaining safety at each excavation. The Contractor shall adhere to the Florida Trench Safety Act (FS 90-96), OSHA trench excavation safety standards (29 CFR, Subpart P, 1926.650), and OSHA trench excavation shielding, sloping, or sheeting requirements. Inspections required by OSHA trench excavation safety standards shall be provided by the Contractor's "competent person," as defined by OSHA 29 CF, Subpart P, 1926. The Contractor's "competent person" shall be identified at the Preconstruction Conference.

The Contractor certifies by submitting the bid and subsequently executing this Contract, that all trench excavation done within his control shall be accomplished in strict adherence with OSHA trench safety standards, the Florida Trench Safety Act, and public safety.

The Contractor also agrees to produce or obtain, prior to award of the subcontracts, identical certification from subcontractors who will perform trench excavation, and to retain such certification for at least 3 years following Final Acceptance.

The Contractor shall consider all available geotechnical information when designing the trench excavation safety system. If sufficient geotechnical information is not available, the Contractor may obtain such to support the requirements set forth above, at no additional cost to the City.

6.03 WORK IN WETLANDS, MANGROVES, AND PRESERVATION AREAS

Strict adherence to all permits is required. Damage to wetlands, periodically wet areas, mangroves, and preservation areas is prohibited. Any such damage by the Contractor shall be duly rectified at no additional cost to the City and as approved by the regulatory agencies.

6.04 CLEARING AND GRUBBING

All clearing and grubbing Work shall conform to all applicable requirements of FDOT-SSRBC Section 110 "Clearing and Grubbing" except as modified herein.

The Contractor shall remove only those trees and bushes necessary to complete the specified Work. Not all the trees and bushes have been located or shown on the Contract Drawings. The



Contractor shall flag those trees and bushes to be removed. All other trees and bushes shall be protected per Specifications.

All roots, stumps, and other debris shall be removed to a depth not less than 12 inches below a bearing surface. The disturbed surface shall be backfilled, graded, and compacted as specified.

No tree or bush shall be removed without the review and acceptance of the Engineer. The Contractor shall obtain all necessary City or County permits for each tree to be removed. Tree removal shall conform to the provisions of the Specifications.

6.05 ROADWAY EXCAVATION

The extent of excavation shall be as shown on the Contract Drawings or otherwise approved by the City and shall include roadway excavation and/or filling and grading, together with the removal of trees, bushes, existing asphalt, concrete, or other material, as required to facilitate construction and restoration as directed by the City.

All excavation Work shall conform to all applicable requirements of FDOT-SSRBC Section 120 "Excavation and Embankment" except as modified herein.

6.06 TRENCH EXCAVATION

Mechanical excavation shall be terminated at least 2 inches above the proposed pipe bed and trench bottom, then shaped and compacted so as to provide uniform bearing on the barrel of the pipe. Particular care shall be taken to recess the bottom of the trench at the bell of the pipe to relieve the bell of all load.

A minimum trench width shall be maintained, allowing room for the jointing and proper compaction of the backfill. If material is encountered that is unsuitable in the opinion of the Engineer, it shall be removed by the Contractor and replaced with acceptable material compacted in place as specified. In the event the Contractor excavates below the elevation required without approval, the Contractor shall backfill with approved materials compacted to obtain a suitable trench bottom, all to the satisfaction of the Engineer and at no additional cost to the City.

The amount of open trench shall be limited so that no more than 100 feet of open trench in advance of the backfilling operation will remain at the end of that working day. All open trench shall be protected by the Contractor with barriers, warning devices, and traffic control devices, which shall be kept in the correct position, properly directed, anchored when required, and clearly visible at all times. The barriers, warning devices, and traffic control devices shall be suitably lighted at all times when vehicular traffic lights are required.

6.07 STRUCTURE EXCAVATION

Excavation shall be of the size and depth required for construction of structures and their foundations. Unsuitable material encountered shall be removed to the depth required to obtain sound foundation material or as ordered by the Engineer. Over-excavated areas shall be filled with approved backfill material compacted as specified, at no additional cost to the City.



Unsuitable existing soil shall be removed and replaced with compacted material, as approved by the Engineer and as specified in the subsection herein headed "Excavation of Unsuitable Material."

6.08 EXCAVATION OF UNSUITABLE MATERIAL

Unsuitable material shall include rock, concrete, and boulders. Unsuitable soft material shall include logs, muck, other soft soils, organic soils, and other soils as specified or as ordered by the Engineer to be unsuitable.

All excavation of unsuitable material shall conform to all applicable requirements of FDOT-SSRBC Section 120 "Excavation and Embankment" except as modified herein.

Unsuitable material encountered below or within the roadway stabilized subgrade, the trench bottom, or a structure bottom, shall be removed by the Contractor to the limits established by the Engineer and disposed of from the Work area at an approved disposal area. Unsuitable material shall be replaced with approved material and compacted as specified.

No additional payment will be made for backfill material obtained from any source and used to replace any unsuitable material except as otherwise specified.

6.09 SHEETING, SHIELDING, AND SLOPING

All excavations shall be properly sheeted, shielded, or sloped to the required slope to furnish safe working conditions, to prevent shifting of material, to prevent damage to structures or other Work, and to avoid delay to the Work, all in accordance with applicable safety and health regulations. The minimum sheeting and shielding for trench excavations shall meet the general trenching requirements of the Florida Trench Safety Act and OSHA standards.

The sheeting and shielding shall be of adequate strength and quantity for the purpose intended. Any sheeting extending below the level of above the top of pipeline shall be cut off as ordered by the Engineer and left in place. In addition, the Engineer may order the Contractor to cut off and leave in place any sheeting, shielding, or other approved support where required to protect construction, property, or existing facilities or utilities.

Damages resulting in the installation or removal of sheet piling shall be rectified by the Contractor at no additional cost to the City.

6.10 DEWATERING

- A. All pipeline and appurtenances shall be laid entirely in a dry trench. All foundations and structure walls shall be constructed or installed in a dry excavation.
- B. Before commencing any excavation at the site of the Work, the Contractor shall submit to the Engineer for review, the methods, equipment, and arrangement of facilities proposed for dewatering and disposal of water at the site and of all water entering any excavation or other part of the Work from any source whatsoever.



- C. Water discharged from dewatering equipment shall be carried into surface drainage facilities except water quality treatment systems and shall not be discharged into sanitary sewer lines. The Contractor shall prevent water from puddling in streets or on private properties. The depositing of dirt in storm drains and ditches and staining of existing facilities shall not be permitted.
- D. Adequate standby facilities shall be provided to ensure that the excavation will be kept dry in the event of power failure or mechanical breakdown. Facilities for the removal and disposal of water shall be of sufficient capacity to keep the excavation dry under all circumstances with one-half of the facilities out of service. If well points are used, provision shall be made for removing and resetting individual well points without taking the system of which they are a part out of service.
- E. The City reserves the right to require the Contractor to replace noisy equipment in order to keep disturbance to a minimum.
- F. The cost of dewatering and disposal of water shall be included in the unit quantity for each appropriate item bid.
- G. Refer to the Specifications for requirements concerning encountered groundwater contaminates.

6.11 BORROW MATERIAL

Any borrow excavation Work shall consist of the excavation and satisfactory utilization of material from areas provided by the Contractor when necessary material is not available from the normal excavation or grading operations. This Work shall conform to FDOT-SSRBC Section 120 "Excavation and Embankment" except as modified herein.

If additional fill material is required, it shall be City approved material supplied and compacted by the Contractor. All compaction under roadway, alley, driveway, curb, walk, or other improved surface shall be to a density as specified in the Contract Documents. Unless otherwise directed by the City, all material not required for construction shall be removed from the premises and disposed of by the Contractor.

6.12 BEDDING MATERIAL

- A. Where shown, ordered, or required, the Contractor shall place bedding material prior to placing pipelines, structures, or slabs. Bedding material may be either excavated approved native sand, concrete sand, gravel, or reclaimed concrete.
- B. Off-site bedding material shall be sand or gravel. Sand bedding material shall be a clean concrete sand of uniform gradation between sieve sizes No. 4 and No. 50. All particles shall pass a 3/8-inch sieve and no particles shall pass a No. 100 sieve.
- C. Gravel bedding material shall meet the requirements of ASTM C33 and shall be coarse aggregate, DOT Size No. 67 (3/4-inch to No. 4) or approved equal.



- D. Reclaimed concrete bedding material shall be graded to meet the size requirements as specified for gravel bedding.
- E. Bedding material, where required, shall be placed in lifts and compacted in a manner to achieve the specified density as specified and/or as shown.
- F. If gravel bedding is used, an impermeable groundwater barrier shall be placed at 100-foot intervals in the gravel bedding. The impermeable groundwater barrier shall consist of a 10 mil sheet of polyethylene covering the full cross sectional area of the gravel, embedded 6 inches into the trench sides and bottom, and extending to the top of the gravel. The barrier shall be offset a minimum of 2 feet from any culvert or pipe joint. Ends and splice points shall be lapped a minimum of 12 inches.

6.13 STRUCTURAL SLAB BEDDING

Structural slabs for manhole bases, footings, and similar structures shall be placed on approved compacted bedding material and leveled as specified and/or as shown.

6.14 BACKFILL MATERIAL

Backfill material shall consist of earth, loam, sandy clay, sand, gravel, soft shale, or other materials, free from organic materials, large clods of earth, or stones. Backfill material shall be either soil classification A-1, A-2 or A-3, per AASHTO M-145, and shall be free of organic matter, lumps of clay or marl, muck, compressible materials, and rock exceeding 2.5 inches in diameter. Broken concrete, masonry, rubble or other similar materials shall not be used as backfill.

6.15 BACKFILL COMPACTION

All backfill shall be compacted as specified herein and shall meet the following minimum density as determined by the AASHTO T-180 method for backfill outside the right-of-way and in City streets, and by the AASHTO T-99 method if in County or FDOT right-of-way.

AASHTO T-180 Method C or D will be used for stabilized subgrade and base compaction tests, and Method A or B will be used for backfill testing, or as directed by the Engineer or jurisdiction.

	T-180	T-99
Roadway stabilized subgrade	98%	N/A*
Roadway base	98%	N/A*
Curb base	98%	N/A
Sidewalk and driveway base	98%	N/A
Pipe bedding	98%	100%
Pipe backfill - under pavement	98%	100%
Pipe backfill - under grass	95%	100%
Structure base slabs	100%	N/A
Structure backfill	98%	N/A



*Roadway stabilized subgrade and base material shall meet LBR requirements as specified in the Contract Documents.

6.16 BACKFILLING OF TRENCH

Backfilling shall be accomplished with suitable material and shall commence only after the pipelines have been laid and tentatively accepted by the City. The space between the pipe and the sides of the trench shall be packed full by hand-shoveled earth free from lumps or debris.

The backfill material shall be placed in 6-inch lifts and compacted, using approved tampers to the required compaction, to a point 12 inches over the top of the pipe. The remaining backfill (under areas other than roadways) shall be placed in uniform lifts not greater than 12 inches thick (or less as approved for mechanical equipment available) and tamped to the required compaction. Backfill under roadways shall be compacted in 6-inch lifts.

Where trenches are improperly backfilled, or where settlement occurs, the trenches shall be reopened to the depth required for proper compaction, refilled and compacted, and the surface restored to the grade and compaction, mounded over and smoothed off.

6.17 BACKFILLING STRUCTURES

Backfill around structures shall be of suitable job-excavated material, suitable off-site fill material, or other material approved by the Engineer. Such backfill shall extend from the bottom of the excavation or top of bedding to the bottom of pavement base course, the bottom of the subgrade for lawns or lawn replacement, the top of the existing ground surface, or to such other grades as may be shown or required.

The backfill shall be placed in uniform lifts not greater than 12 inches thick, and thoroughly compacted in place.

6.18 BACKFILLING UNDER ROADWAYS

Backfill placed under roadways and other paved surfaces shall be compacted in 6-inch lifts and thoroughly compacted in place, with suitable equipment as specified herein.

6.19 DISPOSING OF LEFTOVER MATERIAL

The Contractor shall bring the surface to the same level as existed prior to the excavation. All leftover material shall be hauled from the site and disposed of by the Contractor. Leftover material shall not be stored in or along rights-of-way or easements.

6.20 ADJACENT FACILITIES

The Contractor shall be responsible for the protection, removal, and replacement of all adjacent structures, utilities, trees, shrubbery, curbs, culverts, headwalls, fences, signs, and other miscellaneous structures encountered during the course of the Work.

6.21 TEMPORARY SUPPORTS



Temporary supports for 16-inch and larger pressure and gravity pipes shall be designed by the Contractor and submitted to the City as required by Specifications. Temporary supports that include a structural beam, or other such member(s), shall be designed, signed and sealed by a Professional Engineer.

6.22 FLOWABLE FILL

Where shown on the Contract Drawings, or where ordered by the Engineer, the Contractor shall backfill a void area or an excavation with flowable fill. Flowable fill may be shown, or ordered, to fill abandoned pipes, abandoned underground steel storage tanks, trench backfill, washout area under structural slabs or behind walls, or other similar locations.

Flowable fill shall be produced and delivered to the site. Placing of flowable fill shall be by chute, pumping, or other approved methods. Flowable fill shall be placed to the designated fill line without vibration. The Contractor shall take all necessary precautions to prevent any damage caused by hydraulic pressure of the fill during placement prior to hardening. Flowable fill shall not be used for pipe bedding and backfill in the zone from the bottom of a pipe to 12 inches above the top of pipe.

Flowable fill shall consist of materials conforming to FDOT-SSRBC Sections as follows:

Cement (Type I or II)	Section 921	"Portland Cement and Blended Cement"
Fly ash (Type F)	Section 929	"Supplementary Cementitious Materials"
Fine aggregate (sand)	Section 902	"Fine Aggregate"
Water	Section 923	"Water for Concrete"

The Contractor shall submit a proposed design mix that will produce a flowable fill meeting the strength requirements specified herein, using the following materials:

	Pounds per cubic yard
Cement (Type I or II)	50 - 200
Fly ash (Type F)	0 - 2,000
Fine aggregate (sand)	2,500 - 3,000
Water	325 - 550
Note: 6-inch to 10-inch slump	

Flowable fill material shall be proportioned to produce a 28-day compressive strength approximately as follows:

	Pounds per square inch
Pipe trench backfill	50 - 150
Fill abandoned pipes or tanks	30 - 150
Under slabs, behind walls	300 - 1000
Note: Density in place 115 to 145 pounds per cubic foot.	

Not more than 60 minutes shall elapse between the start of moist mixing and the placement of the flowable fill.



Flowable fill placed on slopes shall have a reduced slump with a reduction in water and shall be able to be shaped as required.

The Contractor shall place the flowable fill in such a manner as to eliminate all cavities.

Flowable fill shall not be placed in salt water. When within a tidal area, the flowable fill shall be placed immediately after the salt water has receded.

When flowable fill is used adjacent to ductile iron pipe, the pipe shall be polyethylene encased.

END OF SECTION



SECTION 7 - SURFACE RESTORATION

7.01 GENERAL

The Work in this section includes restoring and maintaining pavements and pavement bases, curbing, sidewalks, driveways, and grass surfaces that are disturbed, damaged, or destroyed during the course of the Work under this Contract.

The quality of workmanship and materials used in the restoration shall produce a surface equal to or better than the condition before the Work began.

Prior to restoration, the Contractor shall saw cut and remove all existing pavement within 2 feet of the edge of the excavation, or within such widths as may be ordered by the Engineer.

Compaction of soil and base materials shall be tested using the AASHTO T 180 method.

Surface restoration workmanship and materials shall conform to the applicable sections of the FDOT-SSRBC.

All dirt areas disturbed shall be restored with sod, unless otherwise specified.

7.02 ROADWAY RESTORATION

Where the installation of pipe or structures occurs within an existing roadway, the limits of excavation shall be saw cut leaving a straight and square edge. The upper portion of the trench backfill shall be replaced with a compacted shell, crushed (reclaimed) concrete, or limerock base as shown on the Contract Drawings, and paved to match the surrounding surface. Replacement base material shall be the same as the existing base. Roadway restoration shall conform to the detail for shown in the Contract Drawings.

7.03 TEMPORARY PAVEMENT

Immediately upon completion of backfilling, the pavement surfaces damaged or destroyed shall be temporarily restored by placing a shell (FDOT-SSRBC Section 911), crushed (reclaimed) concrete (FDOT-SSRBC Section 204 applicable sections), or limerock (FDOT-SSRBC Section 911) base on the backfilled, compacted subgrade, and an adequate temporary asphaltic patch as shown or as approved by the Engineer. Shell crushed (reclaimed) concrete, or limerock shall be used as a base for all bituminous pavements.

Temporary work shall be maintained in a suitable and safe condition for traffic until the permanent pavement is laid or until final acceptance of the Work.



7.04 SHELL BASE

Shell base shall be constructed on the prepared subgrade to not less than 98 percent of maximum density, in accordance with the requirements of FDOT-SSRBC Section 200. The minimum compacted thickness of shell base shall conform to the detail shown on the Contract Drawings.

7.05 LIMEROCK BASE

Limerock base shall be constructed on the prepared subgrade to not less than 98 percent of maximum density, in accordance with the requirements of FDOT-SSRBC Section 911. The minimum compacted thickness of limerock base shall conform to the detail shown on the Contract Drawings.

7.06 CRUSHED (RECLAIMED) CONCRETE BASE

Crushed (reclaimed) concrete base shall be constructed on the prepared subgrade to not less than 98 percent of maximum density, in accordance with the requirements of FDOT-SSRBC Section 204. The minimum compacted thickness of crushed (reclaimed) concrete base shall conform to detail shown on the Contract Drawings.

The minimum limerock bearing ratio (LBR) value shall be 150.

7.07 ASPHALTIC CONCRETE PAVEMENT

A prime coat shall be applied to the prepared base in accordance with FDOT-SSRBC Section 300 prior to permanent asphaltic concrete pavement.

Unless specified elsewhere, all permanent asphaltic concrete pavement replacement shall be constructed in accordance with the requirements of FDOT-SSRBC Sections 320, 330, 334, and 337. Surface types and compacted thickness shall conform to the detail shown on the Contract Drawings.

7.08 BRICK PAVEMENT

Construction of brick pavement shall follow the details as shown on the Contract Drawings and City standard practice using City standard paving brick or red clay brick conforming to ASTM C 32, Grade SS with City standard dimensions.

Brick street abutting asphalt pavement shall have a minimum 6-inch-wide flush Type A Header Curb.

7.09 CURB AND GUTTER

All permanent restoration of street curb, or curb and gutter, shall be of the same type and thickness as the curb, or curb and gutter, which abuts. The grade of the restored curb, or curb and gutter, shall conform to the grade of the existing adjacent curb, or curb and gutter, so that positive drainage is maintained.

7.10 CONCRETE SIDEWALK



The restoration and construction of concrete sidewalks shall conform to applicable requirements of FDOT-SSRBC Section 522 and the Contract Drawings and shall be constructed where shown on the Contract Drawings and directed by the City. Sidewalk expansion joints with bituminous filler shall be installed at a maximum of 50-foot intervals on center and struck joints shall be spaced equidistant with walk width (joints wider than 6 feet shall be spaced as directed by the City). Where new construction is to be tied into existing facilities, the old material is to be removed back to the nearest construction joint, or sawcut to a straight line as directed by the City or Engineer. The soil under sidewalks and driveways shall be compacted to 98 percent of the maximum density.

New sidewalks shall be 4 inches thick. Concrete pour for walk construction shall be made only on dampened subgrade. A soft broom finish shall be given the walk surface as directed by the Engineer.

Sidewalks crossing driveways shall be constructed according to the Specifications for concrete driveways.

Curb ramps for physically handicapped shall be constructed at all locations where sidewalks cross the curb or where directed by the Engineer. Those existing sidewalks which are removed to accomplish associated work as a part of this Project shall be replaced with a curb ramp when the sidewalk crosses the curb. The cost of curb ramps shall be included in the appropriate proposal item for sidewalk restoration.

Where sidewalks are replaced, the replacement shall be the full width of the walk and the minimum length shall be 60 inches. Restoration of adjacent lawn is incidental to sidewalk replacement and no separate payment will be made therefore.

7.11 HEXAGON BLOCK SIDEWALK

The restoration and construction of hexagon block sidewalks shall conform to the details shown on the Contract Drawings and City standard practice using City standard hexagon blocks.

The soil under sidewalks and driveways shall be compacted to 98 percent of the maximum density. New hexagon block sidewalks shall be 2 inches thick.

Curb ramps for physically handicapped shall be constructed at all locations where sidewalks cross the curb, or where directed by the City or Engineer. Those existing sidewalks which are removed to accomplish associated work as a part of this Project shall be replaced with a curb ramp when the sidewalk crosses the curb. The cost of curb ramps shall be included in the appropriate Pay Item for sidewalk restoration.

Where sidewalks are replaced, the replacement shall be the full width of the walk. Restoration of adjacent grass is incidental to sidewalk replacement and no separate payment will be made therefore.

7.12 DRIVEWAY AND PARKING LOT



Except as otherwise specified, all permanent restoration of base and surface of driveways, parking aprons, and sidewalks shall match the materials, thicknesses, elevations, lines, and grades of the existing construction, all to the Engineer's satisfaction. Patching of Portland cement driveway areas will not be allowed between joints or dummy joints.

For areas where streets are to be paved, or where more than 50 percent of the driveway apron is disturbed, concrete or brick driveways shall be replaced in kind. All other driveways, including shell and dirt, shall be restored with an asphalt concrete surface from the street to the property line or front of sidewalk, as directed by the City or Engineer.

All base compaction under driveways shall be to a minimum density of 98 percent of the maximum density.

7.13 DRIVEWAY - ASPHALT

Residential asphalt driveway restoration shall include 1-inch thick asphaltic concrete surface over 2 inches of compacted sand-asphalt hot mix base, or 5 inches of compacted limerock or shell base.

Commercial asphalt driveway restoration shall be constructed of 1-inch thick asphaltic concrete surface over 8 inches of limerock base compacted in 2 lifts.

7.14 DRIVEWAY - CONCRETE

The restoration and construction of concrete driveways shall conform to applicable requirements of FDOT-SSRBC Section 522 and the Contract Drawings and shall be constructed where shown on the Contract Drawings and directed by the City or Engineer.

Residential concrete driveway restoration shall be 5 inches thick and shall include placing a single layer of 6-inch by 6-inch wire mesh (WWF 6 x 6 - W1.4 x W1.4).

Commercial concrete driveways shall be 6 inches thick with a double layer of 6-inch by 6-inch wire mesh (WWF 6 x 6 - W1.4 x W1.4).

7.15 DRIVEWAY - PEAGRAVEL

Where less than 50 percent of the driveway apron is disturbed, pea gravel driveways shall be restored to match the existing driveway. Pea gravel driveway restoration shall include asphalt treated shell base 5 inches thick after compaction to a minimum density of 98 percent of the maximum.

7.16 DRIVEWAY - SHELL

Where less than 50 percent of the driveway apron is disturbed, shell driveways shall be restored to match the existing driveway. Shell driveway restoration shall be 5 inches thick after compaction to a minimum density of 98 percent.

7.17 GRASS

7.17.01 Sodding



Sod shall be planted as soon as practical after paving, pipeline, or other work has been completed. Sodding shall always be used over seeding.

All work and materials shall meet the applicable requirements FDOT-SSRBC Section 570 (Sodding).

Sodding shall be done as directed by the Engineer, using only material which, in the opinion of the Engineer, is healthy and free of weeds, and (unless specified otherwise by the Engineer) of the same variety predominating at time of removal. Sod may be St. Augustine, Bahia, or other varieties as selected by the Engineer.

Sod shall be planted within 72 hours of being cut. Only moist, green sod having a virile root system may be planted. Sod shall be cut into adjacent sod to provide a smooth surface, and "top dressed" where necessary. Sod shall be rolled or tamped after planting to provide a uniform and consistent grade.

7.17.02 Grass Maintenance

The Contractor shall properly water and otherwise maintain all seeded and sodded areas for a minimum of 60 consecutive calendar days after completion of sodding operations. After the 60 days, and upon receipt of written request from the Contractor, the Engineer will inspect the areas for acceptance by the City. Any area that is washed or eroded, fails to show a uniform stand of healthy, vigorous grassing, or does not appear to be otherwise developing satisfactorily, shall be re-sodded and maintained until suitable for acceptance by the Engineer.

In the event that the stand of grass is found to be contaminated by weeds or other undesirable growth, the Contractor will be required to effectively eliminate such undesirable growth at his own expense.

7.18 EXPANSION JOINT MATERIAL

Expansion joint material for concrete pavement surfaces, including sidewalks and driveways, shall be the bituminous strip type, 1/2-inch thick, and shall conform to applicable requirements of FDOT-SSRBC Section 932.

END OF SECTION



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SECTION 8 – PAINTING

8.01 GENERAL

Painting materials for each system shall be manufactured by one manufacturer. Painting materials not obtainable from the prime manufacturer shall be obtained from a second source recommended by the prime manufacturer for compatibility. All products furnished shall meet current Federal Regulations for lead, mercury and other heavy metals, as well as current VOC air quality regulations. Products of the following acceptable manufacturers may be used on this project, except where noted otherwise.

- A. Ameron – Corrosion Control Division
- B. Devoe & Raynolds Company
- C. Indurall
- D. KopCoat –RPM
- E. MAB Paints
- F. PPG Industries, Inc.
- G. Rust-Oleum Corporation
- H. Sherwin-Williams
- I. Tnemec Company, Inc.

The Contractor shall paint or provide a protective coating for all interior and exterior wood and metal surfaces, all interior masonry, valves, and all submerged piping and other metal, whether specifically called for or not. In addition, all exposed piping shall be painted and further identified in accordance with other sections of these specifications. Because of their very nature, some areas or items do not require specific painting or coating for protection or appearance. The following generally do not require painting or coating unless specifically noted otherwise or required by manufacture, color coding, insulation from dissimilar metals, insulation from concrete or cement products, or architectural considerations:

A. Non-Ferrous Alloys:

Aluminum
Monel
Stainless Steel

B. Corrosion Resistant Metals:

Chromium Plated Steel
Weathering Steel
Galvanized Steel

C. Non-Metallic Materials:

Exterior Brick



Concrete
Glass
Plastic & FRP
PVC
Porcelain

Pre-Finished Manufactured Items:

Cabinets
Louvers
Motor Control Centers
Panels
Signs and Nameplates
Switchgear
Switchboards
Transformers
Tile

D. Electrical Conduits Attached to Unpainted Surfaces.

E. Insulation and Insulation Jackets.

All exposed piping and conduit within the fence enclosure shall be color-coded in accordance with the following Color Coding Schedule:

A. Electric	Gray
B. Gas, Oil, Dangerous Materials	Red
C. Telephone, Telegraph, Television, Communications	Safety Alert Orange
D. Potable Water	Safety Blue
E. Treated Sewage	Safety Green

Other paint colors will be selected by the Engineer

All materials shall be pure and first quality. Materials listed shall be the standard for each such type of material. Primers and finish coats shall be compatible and of the same manufacture where possible. Emulsion and alkyd paints shall contain a mildewcide, and both the paint and mildewcide shall conform to OSHA and Federal requirements, including Fed. Spec. TT-P-19.

8.02 PAINTING SCHEDULES AND SYSTEMS

Painting and coating of surfaces shall conform to the following schedules and systems, unless otherwise specified or shown on the drawings:

- A. Schedule A: System 1 – Exposed exterior structural and miscellaneous steel, piping, equipment to include all stainless steel and carbon steel electrical control cabinets non-submerged, not exposed to corrosion, splash, fumes or immersion conditions.



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1. Prime: One sprayed coat of a combination of a two-part epoxy primer, gray, of 3.0 mils, minimum dry film thickness as by Devoe Paints, Tru-Glaze Epoxy Primer Nos. 12735 and 12702 (ratio 19:1) or equal. If shop coat is damaged, re-prime bare areas in the field. The exterior of electrical cabinets, in stainless steel, shall be sand-blasted and spray-primed per the paint manufacturer's instructions.
 2. Finish: Two coats of "hanging moss green" (Devoe Paints FX-70), Semi-Gloss Advanced Technology Acrylic Resin of 1.5 to 2.0 mils, dry thickness as Exterior Waterborne Semi-Gloss Enamel #83XX by Devoe Paints, or equal. Coats to be applied by spray painting in the shop.
- B. Schedule B: System 2 – Piping and pumping equipment – submerged or non-submerged, exposed to spray, splash or corrosive atmosphere, excluding chains and sprockets, and stainless steel bracing in the wetwell:
1. Prime: One coat chemical resistant red iron oxide, based on a polyamide cured epoxy resin, minimum of 3.0-5.0 mils dry film thickness as by Devoe Paints, Devron 201. If shop coat is damaged, re-prime bare areas in the field.
 2. Finish: Two coats of polyamide cured, epoxy resin coating, minimum of 4.0-6.0 mils dry film thickness per coat as by Devoe Paints, Devron 224HS-color, moss green as required above.
- C. Schedule C: System 3 – Non-Potable water exposed concrete surfaces inside valve vaults, meter vaults, and sanitary sewer manholes.
1. Coal Tar Epoxy (Non-Potable Only)
- Must be recoated within four days at 75deg F. Higher temperature will shorten recoat time.
- Surface Preparation: Brush-Off Blast Cleaning
- | | |
|----------------------------|------------------------|
| 1st Coat: 46-413 Tneme Tar | 8.0 - 10.0 mils |
| 2nd Coat: 46-413 Tneme Tar | <u>8.0 - 10.0 mils</u> |

8.03 EXECUTION

All painting shall be done by skilled and experienced craftsmen and shall be of highest quality workmanship. Application of materials shall be done only on properly prepared surfaces as herein specified.

Before commencing work, the painter shall make certain that surfaces to be covered are in good condition. Should the painter find such surfaces not to be totally acceptable for covering, he shall report such fact to the Engineer. The application of paint shall be held as acceptance of the surfaces and working conditions and the painter will be held responsible for the results reasonably expected from the materials and processes specified.

Hardware, hardware accessories, machined surfaces, nameplates giving manufacturer's data, cover plates, grease fittings, lighting fixtures and similar items in contact with painted surfaces and



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not to be painted shall be removed, masked, or otherwise protected prior to surface preparation and painting operations so they remain clean and free from paint.

Ferrous metals (not shop primed) shall be sandblasted per SSPC-SP6 to remove mill scale and rust. Ferrous surfaces to be submerged or exposed to spray, splash, fumes or corrosive atmosphere shall be sandblasted to near-white metal blast cleaning according to SSPC-SP 10. Brush blast or clean other metals as appropriate to provide suitable surface. Surface profile as obtained from sandblasting shall be recommended by the coating manufacturer. All metal surfaces shall be completely degreased by solvent cleaning in compliance with SSPC-SP 1.

Galvanized surfaces shall be cleaned of dirt, grease and other foreign substances and solvent cleaned. Surfaces shall be pre-treated with one coat of proprietary acid bound resinous or crystalline zinc phosphate preparation, used in accordance with the manufacturer's directions.

Remove glaze, of florescence, dirt, loose particles and grease (and existing paint, if applicable) from concrete receiving masonry paint. Fill all cracks, cut out defective joints and repaint.

In addition to the above listed surface preparations, all dirt, rust, scale, splinters, loose particles, disintegrated paint grease, oil and other deleterious substances shall be removed from all surfaces that are to be coated.

Work shall be done only under favorable weather conditions and as recommended by paint supplier. Exterior painting shall be done only in dry weather. Any surface coating damaged by moisture or rain shall be removed and redone as directed by the Engineer. Coatings shall be mixed, thinned, tinted and applied in accordance with the manufacturer's recommendations. The Contractor shall tint or match colors as selected by the Owner. A sample shall be applied on the job for review and approval before work is actually done. No thinners shall be used except those specifically mentioned and only in such quantity as directed by the manufacturer's instructions. If thinning is used, sufficient additional coat shall be applied to assure the required dry film thickness is achieved.

The manufacturer's recommended thinner or cleanup solvent shall be used for all cleanup. Application by brush, spray, airless spray or roller shall be as recommend by the manufacturer for optimum performance and appearance. Paint shall be applied in a neat manner with finished surface free of runs, sags, ridges, laps and brush marks.

Each coat shall be applied in a manner that will produce an even film of uniform and proper thickness, and no variation in sheen or color. Where more than one coat of paint is specified, each coat shall be sufficiently tinted to result in a perceptible difference in shades of the various coats of paints so that the application of subsequent coats can be properly and uniformly spread and inspected. Provision shall be made to allow thorough drying between coats as recommended by the manufacturer before the next coat is applied, and paint used in successive field coats shall be produced by the same manufacturer.

Seal coats shall be used over bitumen-coated surfaces as applicable. Plastic pipe shall be painted in accordance with the pipe manufacturer's recommendations. Pipes, shoot metal ducts and other metal items which are to be installed in inaccessible locations shall be painted prior to installation.

Pumps, motors, machinery, equipment, electrical panels and other manufactured items shall have



surfaces prepared, primed and coating in accordance with the recommendations of the manufacturer, and be given at least one touch-up coat with the intermediate coat material and one complete finish coat in the field.

The prime and intermediate coats for the various coating systems shall be as specified earlier and shall be compatible with the field coat or coats. Paint used in the first field coat over shop painted or previously painted surfaces shall cause no wrinkling, lifting or other damage to underlying paint.

All completed surfaces will be checked by the Engineer, and the Contractor shall provide the necessary properly calibrated gages. All non-ferrous surfaces shall be checked for number of coats and thickness by use of a Tooke gage. All ferrous surfaces shall be checked for film thickness by use of Elcometer or Micro-Test magnetic dry film gauge properly calibrated. All defects shall be corrected to the satisfaction of the Engineer.

All paint brushed, splattered, spilled, or splashed on any surface not specified to be painted shall be removed. Upon completion of the painting work, the Owner shall be furnished one (1) gallon of each type and color of finish paint for touching up at no additional cost. Paint container labels, in addition to other required information, shall have location of color and type marked thereon.

Surfaces to be painted shall be inspected before any paint materials are applied, and after preparation has been completed.

Painted surfaces shall be inspected between coats, prior to application of next coat of painting material. Failure to get acceptance between coats will nullify credits for coats previously applied.

All paint shall be delivered to the job site in unopened original containers.

All paint not intended for the job shall be removed from the job site.

END OF SECTION



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SECTION 9 - PIPING MATERIALS: DUCTILE IRON PIPE AND FITTINGS

9.01 GENERAL

The Work in this section includes furnishing all ductile iron pipe, fittings, joints, and appurtenant materials. All castings furnished shall have been cast in the United States of America unless complete certification is furnished in accordance with the latest edition of ANSI/AWWA C 110.

Standards referenced in this section are the latest revision of the following specifications:

ANSI/AWWA C104	"Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water"
ANSI/AWWA C110	"Ductile-Iron and Gray Iron Fittings, 3-Inch through 48-Inch, for Water and Other Liquids"
ANSI/AWWA C111	"Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings"
ANSI/AWWA C115	"Flanged Ductile-Iron Pipe with Threaded Flanges"
ANSI/AWWA C150	"Thickness Design of Ductile-Iron Pipe"
ANSI/AWWA C151	"Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids"
ANSI/AWWA C153	"Ductile-Iron Compact Fittings, 3-Inch through 24-Inch, for Water and Other Liquids"
ASTM D 1248	"Polyethylene Plastics Molding and Extrusion Materials"

9.02 PIPE

9.02.01 GENERAL

All ductile iron pipe shall be designed in accordance with ANSI/AWWA C150. Pipe shall be minimum pressure class as follows:

Size	Pressure Class
3-inch through 18-inch	350
20-inch through 24-inch	300
30-inch through 48-inch	200

For threaded flanged pipe the minimum thickness shall be the nominal thickness as shown on Table 15.1 of ANSI/AWWA C115.

Thickness shall be designed for a flat-bottom trench backfill lightly consolidated to centerline of pipe. Pipe shall be manufactured in accordance with ANSI/AWWA C151.

The pressure rating, metal thickness class, net weight of pipe (without lining) length of pipe, name of manufacturer, "DI" or "DUCTILE," and country where cast, shall be clearly marked on each length of pipe.

The Contractor shall take extreme care when handling pipe and fittings to ensure the interior lining does not get damaged during construction. Lined pipe and fittings must be handled only



from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying. The pipe shall not be dropped or unloaded by rolling.

Care should be taken not to let the pipe strike sharp objects while swinging or being off loaded. Ductile iron pipe should never be placed on grade by use of hydraulic pressure from an excavator bucket or by banging with heavy hammers.

9.02.02 LINING

- A. **Potable Water Lines and Reclaimed Water Lines:** Ductile iron pipe and fittings for use in potable and reclaimed water lines shall be cement mortar lined. Cement lining shall conform to ANSI/AWWA C104, and seal coated with approved bituminous seal coat in accordance with ANSI/AWWA C151. Seal coating shall be UL listed or NSF approved for use in potable water mains.
- B. **Sanitary Force Mains and Gravity Sanitary Pipe:** Ductile iron pipe and fittings for sanitary sewer force mains and gravity sewer pipe shall be polyethylene, polyurethane, or epoxy lined.

Epoxy lining shall be 40 mil minimum thickness (multi-pass process) and shall be Protecto 401 Ceramic Epoxy, as manufactured by the Protecto Division of Vulcan Painters, Inc., or approved equal.

Polyethylene lining shall be factory furnished with a fusion bonded polyethylene liner of 60 mil minimum thickness conforming to ASTM D1248, such as Polybond Plus as furnished by American Cast Iron Pipe Co. or approved equal.

Polyurethane lining shall be factory applied conforming to Corropipe, as manufactured by Madison Chemical Industries, Inc., or an approved equal. Material shall be applied in conformance with the manufacturer's recommendation and shall be a 40-mil final dry film thickness.

For any lining method, to ensure a holiday-free lining, documentation must be provided, prior to shipment, showing each section of lined pipe has passed holiday testing at the time of production per ASTM G62. The lining shall have a minimum three (3) year warranty covering failure of the lining and bond failure between liner and pipe.

- C. **Storm Drain Gravity Pipe:** Ductile iron pipe and fittings for storm drain gravity pipe shall be epoxy lined as per sanitary pipe or cement mortar lined as per water pipe, at the Contractor's option.

9.03 FITTINGS

Ductile iron fittings shall conform to ANSI/AWWA C110 or ANSI/AWWA C153.

Fittings shall be suitable for a minimum water pressure plus water hammer as follows:



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Size	Type	Pressure Rating
3-inch through 12-inch	DI	350
14-inch through 24-inch	DI	350
30-inch through 48-inch	DI	250

Fittings shall be coated outside with petroleum asphaltic coating, 1 mil minimum thickness.

Fittings shall be lined as specified herein headed "4.02 Pipe."

Anchor couplings equal to McWayne Clow F-1211 for fire hydrant assemblies may be substituted with an anchoring tee equal to Catalog No. A-10180 locked hydrant tee as manufactured by American Ductile Iron Pipe Co. or hydrant tee with rotatable MJ gland as manufactured by U.S. Pipe Co. in place of the MJ tee and anchor coupling as shown, at the Contractor's option.

9.04 JOINTS - BURIED PIPE AND FITTINGS

Joints for ductile iron pipe and fittings shall conform to ANSI/AWWA C111, except as otherwise specified. All pipe and fittings shall be furnished complete with joint accessories necessary for installation conforming to ANSI/AWWA C111. No additional payment will be made for joint accessories, including retainer glands, unless otherwise specified.

The Contractor shall furnish and install all necessary materials, equipment, and appurtenances required to complete the work.

- A. **Unrestrained Joints:** Joints for unrestrained pipe shall be push-on joint. Joints for fittings, when installed with unrestrained pipe, shall be mechanical joint with DI retainer glands, as specified herein for restrained joints.
- B. **Restrained Joints:** All joints in restrained pipe systems shall be of the same type (pipe and fittings), except valves shall be mechanical joint with DI retainer glands as specified.
 - 1. **12-inch and Smaller:** Joints for restrained pipe and fittings, 12-inch and smaller, shall be one of the following:
 - a. Push-on restrained joint utilizing a retainer ring, equal to U.S. Pipe TR Flex. It shall be UL listed, FM approved, or shall be certified by an approved laboratory that the restrained joint will not separate at the specified test pressure.
 - b. Push-on restrained joint using a locking type gasket, equal to Field-Lok, as manufactured by U.S. Pipe and Foundry, Inc. It shall be UL listed, FM approved, or shall be certified by an approved laboratory that the restrained joint will not separate at the specified test pressure.
 - c. Mechanical joint with DI retainer glands shall be furnished with retainer glands equal to Series 1100 Megalug, as manufactured by EBAA Iron Inc., Stargrip 3000 as manufactured by Star Pipe Products, or DI MJ Gripper Gland as manufactured by



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U.S. Pipe and Foundry Co. for use with ductile iron pipe. All retainer glands shall be UL listed, FM approved, or shall be certified for 350 psi pressure rating with a 2:1 safety factor.

2. **Larger than 12-inch:** Joints for restrained pipe and fittings larger than 12-inch shall be as follows:
 - a. Restrained pipe joints shall be modified push-on restrained joint, equal to U.S. Pipe TR Flex, and shall be UL listed or FM approved.
 - b. Fittings joints shall be equal to U.S. Pipe TR Flex or shall be mechanical joint with DI retainer glands. Retainer glands shall be equal to Series 1100 Megalug or Stargrip 3000 for 16-inch and larger pipe. All retainer glands shall be UL listed, FM approved, or certified for 350 psi pressure rating (for 16-inch) and 250 psi pressure rating (for larger than 16-inch) with a 2:1 safety factor.
 - c. Valve joints shall be mechanical joint with DI retainer glands as specified herein for larger than 12-inch fittings joints.

9.05 JOINTS - EXPOSED PIPE AND FITTINGS

Joints for exposed ductile iron pipe and fittings shall be restrained, except as otherwise noted on the Contract Drawings. Joints for exposed pipe in plants and in vaults shall be flanged where noted on the Contract Drawings.

Joints for exposed pipe and fittings 12-inch and smaller shall be modified push-on restrained joint using a retainer ring, or modified push-on joint using a locking type gasket, as specified herein headed "9.04 Joints - Buried Pipe and Fittings."

Joints for exposed pipe and fittings larger than 12-inch shall be modified push-on restrained joint using a retainer ring as specified herein headed "9.04 Joints - Buried Pipe and Fittings."

9.06 DETECTION

Pipe shall have 3-inch detectable metallic tape of the proper color placed directly above the pipe and 12-inch below finished grade or 6-inch detectable tape between 12-inch and 24-inch below finished grade.

Pipe shall also have tracer wire installed along the pipe alignment. The tracer wire to be used shall be a solid, 10-gauge, high strength, copper clad steel wire with a polyethylene jacket of appropriate color manufactured by Copperhead Industries or approved equal.

9.07 ZINC/EPOXY/FLUOROPOLYMER PROTECTIVE COATING



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Joints and Pipe exposed to extreme coastal environments including, but not limited to, aerial ocean crossings shall have this system or an approved equal applied as a protective coating.

Surface Preparation: SSPC-SP6/NACE No.3 Commercial Blast Cleaning with a minimum 1.5 mil angular anchor profile.

Tnemec

Primer: Series 90-97 Tneme-Zinc
2nd Coat: Series 66HS Hi-Build Epoxoline
3rd Coat: Series 700 Hydroflon

Coating Thickness

2.5 - 3.5 mils
3.0 - 6.0 mils
2.0 - 3.0 mils

Total Dry Film Thickness: 7.5 - 12.5 mils

Minimum Dry Film Thickness: 9.5 mils

END OF SECTION



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SECTION 10 - PIPING MATERIALS: PVC PRESSURE PIPE

10.01 GENERAL

The Work in this section includes furnishing all Polyvinyl Chloride (PVC) pressure pipe and fittings. PVC pressure pipe includes all PVC pressure pipe 2-inch through 36-inch.

Standards referenced in this Section are the latest revision of the following specifications:

ANSI/AWWA C900-16	"Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In."
ANSI/AWWA C110	"Ductile-Iron and Gray-Iron Fittings, 3-Inch through 48-Inch for Water"
ANSI/AWWA C111	"Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"
ANSI/AWWA C153	"Ductile-Iron and Gray-Iron Fittings, 3-Inch through 48-Inch for Water"
ASTM D 1784	"Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds"
ASTM D 1785	"Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120"
ASTM D 2241	"Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)"
ASTM D 3139	"Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals"

10.02 PIPE

- A. **Two-inch Pipes:** All 2-inch PVC pipe shall meet ASTM D 1784 specification for rigid PVC compounds and ASTM D 2241 specification for PVC plastic pipe. PVC pipe shall be suitable for use at maximum hydrostatic working pressure of 160 psi at 73°F. Pipe shall have a standard dimension ratio (SDR) 26 and bear the NSF Seal for potable water pipe.
- B. **4-inch Through 36-inch Pipes:** PVC pressure pipe 4-inch through 36-inch shall meet the requirements of ANSI/AWWA C900-16, with outside diameter dimensions of ductile iron pipe. All 4-inch through 36-inch PVC pressure pipe shall be Class 235 and DR18.
- C. **UV Resistant PVC Pipe:** All PVC piping exposed to sunlight shall contain titanium dioxide for UV resistance, and shall conform to ASTM D 1784 and ASTM D 1785 (IPS). The Contractor shall submit the manufacturer's certificate of conformance to the City. Pipe shall be marked with manufacturer's identification.

10.03 FITTINGS

- A. **Two-inch Pipes:** Gasketed joint standard dimension ratio (SDR) 21 PVC or galvanized steel fittings shall be used with all 2-inch PVC pipe. PVC adapters, Harco as manufactured by the Harrinton Corporation or approved equal, shall be used for jointing to 2-inch gate valves, galvanized fittings, and existing threaded pipe.



B. Four-inch Through 36-inch Pipes

1. **Molded PVC Pressure Fittings:** Fittings for 4-inch through 8-inch sanitary sewer pressure pipe shall be molded PVC pressure fittings, unless DI fittings are directed by the Engineer. Molded PVC fittings shall meet the requirements of ANSI/AWWA C900-16 and shall be Harco Class 150 as manufactured by the Harrington Corporation, or approved equal, as directed by the Engineer.
2. **DI Fittings:** Fittings for pipe larger than 8-inch shall be DI, mechanical joint. DI fittings for 4-inch through 36-inch PVC pressure pipe shall conform to ANSI/AWWA C110 or C153 and shall conform to the Technical Specifications section headed "Piping Materials: Ductile Iron Pipe and Fittings."

- C. Where flanged fittings are shown, specified, or directed by the Engineer, adapter flanges shall be used on plain end PVC pipe. Adapter flanges shall be suitable for PVC pipe and be equal to Uni-Flange Series 900 as manufactured by Ford/Uni-Flange, Wabash, Indiana.

10.04 JOINTS

Pipe joints shall be plain end, rubber gasket push-on joints, unless otherwise shown. Push-on joints shall meet the requirements of ASTM D 3139.

Joints to DI fittings shall be rubber gasket mechanical joints with retainer glands, unless otherwise shown. All retainer glands shall be UL listed or FM approved. The retainer glands shall be installed in accordance with the manufacturer's recommendations.

Mechanical joints shall meet the requirements of ANSI/AWWA C111.

10.05 DETECTION

Pipe shall have 3-inch detectable metallic tape of the proper color placed directly above the pipe and 12-inch below finished grade or 6-inch detectable tape between 12-inch and 24-inch below finished grade.

Pipe shall also have tracer wire installed along the pipe alignment. The tracer wire to be used shall be a solid, 10-gauge, high strength, copper clad steel wire with a polyethylene jacket of appropriate color manufactured by Copperhead Industries or approved equal.

10.06 MARKINGS AND COLOR CODING

In addition to the standard markings required by ANSI/AWWA C900-16, the letters NSF denoting National Sanitation Foundation approval shall be included in the marking system, on each pipe length and fitting.

PVC pipe shall be manufactured of solid color as specified, or white with continuous colored ink lettering. The applicable color codes, with light color stabilant, are as follows:



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Pipe Use	Color Coding
Potable Water	Safety Blue
Sanitary Sewer	Safety Green
Reclaimed Water	Safety Purple

UV resistant PVC pipe shall be solid color as specified above, or white with colored lettering as specified above.

10.07 HARNESSING

Ductile iron fittings with mechanical joints used with PVC pipe that require harnessing, shall be provided with ductile iron retainer glands such as Series 2000 PV Megalug as manufactured by EBAA Iron Inc., Stargrip 4000 as manufactured by Star Pipe Products, or approved equal.

PVC push-on joints for pipe in casings, for joints to PVC pressure fittings, or where shown, shall be harnessed using a ductile iron retainer for push-on joint PVC pipe, such as Series 1600 as manufactured by EBAA Iron Inc., Series 1100 as manufactured by Star Pipe Products, or approved equal.

10.08 INSPECTION AND TESTING

All pipelines shall remain undisturbed for 24 hours to develop complete strength at all joints. All pipelines shall be subjected to a hydrostatic pressure and leak test per the Specifications.

END OF SECTION



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SECTION 12 - PRESSURE PIPE CONSTRUCTION

12.01 GENERAL

The Work in this section includes construction of potable water mains, reclaimed water mains, sanitary force mains, and appurtenances.

Pressure pipelines are to be constructed at locations shown on the Contract Drawings. The City reserves the right to make minor changes in grade and/or alignments as the Work progresses.

Piping materials for pressure pipe installations shall be as follows:

Potable Water Main		
PVC Pipe	2-inch	
DI Pipe	6-inch and larger	
HDPE Pipe	2-inch and larger	ASTM D3350 meeting PE 3408 code designation
Galvanized Pipe	2-inch blow-off assemblies, 2-inch connections, 2-inch short tunneling, and 2-inch short relocations	
Fittings	2-inch PVC pipe:	PVC with gasketed joint
	2-inch galvanized pipe	Galvanized steel with threaded joint
	6-inch and larger pipe	Ductile Iron (DI) with push-on or mechanical joint

Sanitary Force Main		
PVC Pipe	4-inch through 36-inch:	ANSI/AWWA C900-16
DI Pipe	14-inch and larger pipe:	ANSI/AWWA C151
HDPE Pipe	2-inch and larger	ASTM D3350 meeting PE 3408 code designation
PVC Fittings	4-inch through 48-inch pipe:	DI with push-on or mechanical joint
DI Fittings	4-inch and larger pipe:	DI with push-on or mechanical joint
HDPE Fittings	2-inch and larger pipe:	ASTM D3350 meeting PE4710 code designation or DI with HDPE mechanical joint adapter

All existing water services shall be kept in service during the construction of water mains and the preparation of new service connections. Water meters requiring disconnection by the Contractor to accomplish the Work shall be promptly restored to service by the Contractor. The Contractor shall give a minimum of 24 hours prior written notice to all affected water customers of the intended service interruption.

All pipe, fittings, and appurtenances shall be furnished by the Contractor and be transported, delivered, and installed by the Contractor in accordance with the requirements of the subsection



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headed "Laying and Jointing Pipelines."

All pipelines shall be tested in accordance with the requirements of the subsection headed "Testing and Disinfection of Pressure Pipelines: Pressure Test."

All potable water and reclaimed water pipelines shall be disinfected before they are put into service as specified in the subsection headed "Testing and Disinfection of Pressure Pipelines: Disinfection."

As-built drawings shall be submitted to the Engineer prior to acceptance of the Work and prior to commencement of the warranty period.

Standards referenced in this Section are the latest revision of the following specifications:

ANSI/AWWA C105	"Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids"
ANSI/AWWA C110	"Ductile-Iron and Gray-Iron Fittings, 3-Inch through 48-Inch
ANSI/AWWA C111	"Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"
ANSI/AWWA C504	"Rubber-Seated Butterfly Valves"
ANSI/AWWA C509	"Resilient-Seated Gate Valves for Water and Sewerage Systems"
ANSI/AWWA C515	"Reduced Wall, Resilient-Seated Gate Valves for Water Supply Service"
ANSI/AWWA C550	"Protective Epoxy Interior Coating for Valves and Hydrants"
ANSI/AWWA C600	"Installation of Ductile-Iron Water Mains and Their Appurtenances"
ANSI/AWWA C605	"Underground Installation of PVC Pressure Pipe and Fittings for Water"
ANSI/AWWA C651	"Disinfecting Water Mains"
ANSI/AWWA C800	"Underground Service Line Valves and Fittings"
ANSI/AWWA C900-16	"Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In."
ANSI/AWWA C901	"Polyethylene (PE) Pressure Pipe and Tubing, 1/2-Inch through 3-Inch for Water Service"
ANSI/AWWA C906	"Polyvinyl Chloride (PVC) Pressure Pipe and Fittings 4-Inch through 63-Inch, for Water Distribution and Transmission"
ANSI/AWWA C901	"Polyethylene (PE) Pressure Pipe and Tubing, 1/2-Inch through



3-Inch for Water Service"

ASTM A 126	"Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings"
ASTM D 429	"Test Methods for Rubber Property - Adhesion to Rigid Substrates"
ASTM D 3139	"Standard Specification for Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals"

12.02 DATA TO BE SUBMITTED

The Contractor shall submit shop drawings in accordance with the Specifications.

Pipe
Valves
Joints and joint accessories
Fittings
Specials and accessories
Special linings and coatings
Water service materials

12.03 MATERIALS

All pressure pipe materials shall be in accordance with the applicable requirements of the Technical Specifications sections headed:

DIP "Piping Materials: Ductile Iron Pipe and Fittings"
PVC "Piping Materials: PVC Pressure Pipe"
HDPE "Piping Materials: HDPE Pressure Pipe"

All pressure pipe materials (pipe, fittings, valves, valve boxes, tapping valves and sleeves, precast thrust blocks, blow-offs, house services, etc.) except fire hydrants, shall be furnished by the Contractor. All pressure pipe fittings and valves shall be cast and manufactured in the United States of America unless complete certification is furnished in accordance with ANSI/AWWA C110.

All materials furnished shall be new. Materials not specified herein or on the Contract Drawings shall conform to AWWA Standards and Industry Standards.

Piping, concrete, masonry, and all other materials shall conform to those materials as specified in the appropriate Technical Specifications sections for those materials. Specific pressure pipe and appurtenances materials shall conform to the following specifications:

12.03.01 2-INCH DIAMETER PIPE

1. Steel pipe shall be standard galvanized steel, Schedule 40, furnished in 21-foot lengths with both ends threaded.
2. All 2-inch steel fittings shall have screw type joints.



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3. Pipe thread compound shall not be used. Threads shall be wrapped with teflon joint tape, non-hardening, Mil. Spec. T27730A. Cutting oils shall be dark, non-toxic, and equal to cutting oil manufactured by the Rigid Tool Company. The Contractor shall take caution not to allow cutting oil inside the pipe and shall remove all cuttings. Cutting oils shall be UL listed or NSF approved for use in potable water systems.
4. PVC pressure pipe to be used in the potable water system shall be Safety Blue in color or white with Safety Blue identification tape or color coded approved ink lettering as specified. PVC pressure pipe to be used in the reclaimed water system shall be Safety Purple in color or white with Safety Purple identification tape or approved color-coded ink lettering as specified.

PVC pipe shall conform to the Technical Specifications section headed "Piping Materials - PVC Pressure Pipe."

5. HDPE pressure pipe shall conform to the Technical Specifications section headed, "Piping Materials – HDPE Pressure Pipe."

12.03.02 VALVES - GENERAL

1. Valves shall be iron body, bronze mounted, and have joint ends as shown or specified. Valves shall have O-ring seals, unless otherwise specified.
2. A standard 2-inch square AWWA operating nut shall be provided on each valve. Valves shall have non-rising stems and shall open when the nut is turned counterclockwise. Each nut shall be marked with an arrow.
3. All valves of the same type shall be from the same manufacturer. Parts of valves of the same type and size shall be interchangeable. Unless otherwise specified, all valves shall be designed for a cold water working pressure of 150 psi.
4. All valves shall be furnished complete with gaskets, bolts, nuts, and glands necessary for installation.
5. All valves larger than 2-inch shall have restrained rubber gasketed compression joints, or mechanical joints with retainer glands, conforming to ANSI/AWWA C111, at the Contractor's option unless otherwise noted.
6. Valves used for sanitary force mains shall be the same as those used in other pressure pipe applications, unless otherwise specified.
7. Upon request, the valve manufacturer shall provide an affidavit of compliance, proof of design testing, and proof of production testing.

12.04 CONNECTIONS TO EXISTING MAINS

The Contractor shall connect the new pressure pipelines to the existing pressure pipelines at



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locations as shown on the Contract Drawings and as specified. The Engineer shall be notified at least 2 working days prior to making connections. The time at which the connections are to be made and the manner of making the connections shall be subject to review and acceptance by the Engineer.

The connections to the existing pressure pipeline shall be made to minimize the time during which the existing pressure pipeline will be out of service. The Contractor shall utilize the necessary number of crews and types of equipment and shall work the necessary hours to ensure completion of the connections within the time specified.

12.05 CONSTRUCTION OPERATIONS

Pressure pipelines shall be installed in open trenches, except when another method, such as jacking, boring, or tunneling, is shown on the Contract Drawings, specified, or ordered. Jetting shall not be allowed under roadway, alley, or driveway.

Pipe and fittings shall not be strung in residential areas more than 3 weeks in advance of pipelaying, unless otherwise approved by the Engineer. The Contractor shall install pipelines, pressure test, disinfect, and restore the ground surface in pipeline segments of 3,500 linear feet or less, except as otherwise approved by the Engineer. The new segment of pipelaying shall not start until restoration has commenced on the previous segment, or as approved by the Engineer.

Pipeline segments shall be pressure tested and disinfected after pipelaying is complete, to minimize inconvenience to the Public, except as otherwise approved by the Engineer.

No excavation shall be left open over a weekend. All pavement openings shall be completely repaired as specified in the Technical Specifications section headed "Surface Restoration" within 7 days of opening, or a temporary asphaltic pavement patch placed and maintained daily.

Where shown on the Contract Drawings or where directed by the Engineer, the Contractor shall remove existing pipelines which are shown to be abandoned. Any such pipe, fitting, etc., shall be removed after the new pipeline (replacing the existing line) is accepted and put into service by the City. Removed pipe and appurtenances 6 inches or larger which are described elsewhere or deemed by the Engineer to be reusable shall be delivered to the City by the Contractor. All material not deemed reusable shall become the Contractor's property and shall be removed from the site by the Contractor. No additional payment will be made for salvaging pipe and fittings.

Short tunneling of pressure pipe shall be constructed as required to protect trees, shrubs, and existing surface or subsurface utilities and structures. Short tunnels shall be constructed to the lengths shown on the Contract Drawings, specified, or directed by the Engineer.

Existing fences shall be restored by the Contractor and shall be finished and installed so that the restoration is equal to or better than the original. Only those portions of original fencing or materials there from, that the Engineer approves for re-use, shall be used by the Contractor in fence restoration. All other materials, including lumber, paint, wood preservative, concrete, and metal products shall be furnished by the Contractor.

The cost of protecting, replacing, relocating, and maintaining (including using hay bales) storm and



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sanitary sewerage facilities shall be included in the various unit price Pay Items, and no separate payment will be made therefore unless otherwise specified in other Pay Items.

12.06 LAYING AND JOINTING PRESSURE PIPELINES

All pressure pipeline installation shall comply with applicable standards of ANSI/AWWA C600, C605, and C906, and with these Specifications.

Mechanical joint fittings and valves installed in sections of unrestrained pipe, and in blow-offs, shall be installed using ductile iron retainer glands, as set forth in the Technical Specifications section headed "Piping Materials: Ductile Iron Pipe."

PVC push-on fittings for pressure pipelines shall conform to the Technical Specifications section headed "Piping Materials: PVC Pressure Pipe."

Laying and jointing of HDPE pressure pipe shall conform to the Technical Specifications section headed "Piping Materials: HDPE Pressure Pipe."

Excavation and backfill shall conform to the Technical Specifications section headed "Excavation and Backfill."

In lieu of jacking and boring or pushing of pipe up to 4-inch in diameter, the Contractor may use a soft bore directional drilling process as provided by Flow Mole Corporation or approved equal.

Cover for all pressure pipeline Work, if not shown on the Contract Drawings, shall be not less than:

	2-inch and 4-inch	6-inch and larger
Under roadways and alleys:	36 inches	36 inches
Under grass and sidewalks:	24 inches	30 inches

Unless otherwise noted on the Contract Drawings or in other sections of this Specification, the pressure pipeline shall be handled and installed in strict accordance with the manufacturer's instructions and with the applicable AWWA Standards. If a conflict exists between the manufacturer's instructions and the AWWA Standards, the manufacturer's instructions shall govern.

Any defective material shall be removed from the job site immediately. Should a defect be discovered after the item has been placed in the trench, the replacement will be at the Contractor's expense. Materials shall be stored along installation routes in a manner acceptable to the Engineer or as described elsewhere in the Specifications.

Polyethylene wrapping shall be installed on ductile iron pipe and appurtenances where shown on the Contract Drawings or where ordered by the Engineer.

Polyethylene encasement materials and installation shall meet the applicable requirements of ANSI/AWWA C105. Care shall be taken while backfilling to prevent puncturing, tearing, or otherwise damaging the polyethylene wrapping.



The Contractor shall use every precaution during construction to protect the pressure pipeline against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder or contaminate the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment.

All dewatering shall meet the requirements set forth in the Technical Specifications section headed "Excavation and Backfill."

Watertight plugs of an approved type shall be installed in the ends of all pipe, fittings, and valves during 24-hour or longer periods when installation is not in progress, or as required to prevent ditch water, sand, etc. from entering the pipe.

Concrete thrust blocks of the proper size and type shall be furnished and installed at all locations where a change in the pipe alignment exceeds 7 degrees or dead ends, unless Contract Drawings show that adjacent pipe, in excess of 2 bells each direction, shall be restrained. Concrete thrust blocks used on 12-inch and larger mains shall be poured in place. Precast thrust blocks may be used on mains less than 12-inch in diameter. Thrust block concrete shall conform to the Technical Specifications section headed "Concrete, Masonry, and Reinforcing Steel."

Boring, soft boring, and jacking work other than new services shall strictly conform to all applicable stipulations of the State of Florida Department of Transportation Utility Accommodation Manual, unless otherwise specified. Softbore shall utilize a guided boring system, equal to FlowMole or DirectLine.

12.06.01 Expose Existing Pressure Pipeline and Record Elevation

The Contractor shall expose the existing pressure pipelines prior to the construction stake-out to determine the station, offset, and elevation, before actual construction begins. The Contract Drawings may be modified by the Engineer, as necessary, to accommodate the pressure pipelines which must remain.

12.06.02 Conflict Adjustment of Existing Pressure Pipelines

In some locations existing pressure pipelines intended to remain in service may need to be adjusted horizontally or vertically to avoid conflicts with the proposed storm drains, sanitary sewers, roadway base, manholes, inlets, or other proposed improvements. The conflict may not be shown on the Contract Drawings.

In the event that a conflict is encountered and confirmed by the Engineer, the adjustment to alleviate the conflict shall be constructed in accordance with the applicable "Obstruction Detail" or as ordered by the Engineer.

12.06.03 Pipe Joints

1. **Standard Mechanical Joints:** In making mechanical joints, the pipe shall be centered in the bells. The surfaces of ductile iron pipe with which the rubber gasket comes in contact shall be thoroughly brushed with a wire brush just prior to assembly of the joint. The surfaces of PVC pipe shall be wiped clean with a cloth and soapy water. A pipe lubricant



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shall be brushed over the gasket just prior to installation. The gasket and gland shall be placed in position, the bolts inserted, and the nuts tightened finger tight. The nuts shall be tightened by means of a torque wrench, or as approved by the City, in such a manner that the gland shall be brought up evenly into the joint. The following range of bolt torques shall be applied:

Bolt Size (inch dia.)	Range of Torque (foot lbs.)
5/8	45 - 60
3/4	75 - 90
1	70 - 100

If effective sealing is not obtained at a maximum torque listed above, the joint shall be disassembled and reassembled after thorough cleaning.

2. **DI Pipe Push-On Joints:** In making up the push-on rubber gasket joint, the gasket seat in the socket shall be thoroughly brushed with a wire brush and the gasket shall be wiped with a clean cloth. The gasket shall be placed in the socket with the large round end entering first so that the groove fits over the bend in the seat. A thin film of approved lubricant shall then be applied to the inside surface of the gasket that will come in contact with the entering pipe. The plain end of the pipe to be entered shall be thoroughly brushed with a wire brush and placed in alignment with the bell of the pipe to which it is to be joined. Ends of cut pipe shall be ground to a smooth bevel edge before inserting in bell. The joint shall be made up by exerting sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket.

Backhoe buckets or excavation equipment are not to be applied directly to the pipe.

3. **PVC Pipe Push-On Joints:** Procedures for the making of PVC pipe push-on joints shall be similar in nature to those set forth in the preceding paragraph (except the bell shall be wiped with a clean cloth). Procedures shall strictly follow the manufacturer's printed instruction for the making of joints. In a like manner, all other PVC pipeline Work shall be performed in accordance with the manufacturer's recommendations.
4. **Restrained Joints:** Ductile iron mechanical joint pipe, fittings, and valves 12-inch and smaller that require restraint shall be installed using ductile iron retainer glands, as specified. The glands shall be installed in accordance with the manufacturer's recommendations. Glands using a frangible bolt for setting the restraining devices shall be tightened with standard wrenches.

Glands using standard bolts for setting the restraining devices shall be tightened with a torque wrench. The assembly shall be given 2 heavy coats of a bituminous coating after installation.

Restrained push-on joint pipe, fittings, and valves, where shown on the Contract Drawings, shall be with a restraining gland or restraining gasket, as specified.



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Pipe, fittings, and valve joints shall be restrained at locations shown on the Contract Drawings, or as specified. In addition, all other fittings and valves shall be installed using a ductile iron retainer gland.

The following shall apply to various restrained joint/pipe size type:

Pipe Size (Inches)	Restrained Joint Type
2	No restrained joint allowed
4 through 12	Mechanical joint/retainer glands Tyton Pipe/Loc Fast Gasket, or equal
16 and larger	Mechanical joint/retainer glands TR Flex, or equal, pipe valves and fittings

12.06.04 Color Coding

Prior to backfilling, all pressure pipelines shall be identified with color coding. The applicable color codes, with light color stabilant, are:

Pipe Use	Color Coding
Potable Water	Safety Blue
Sanitary Sewer	Safety Green
Reclaimed Water	Safety Purple

1. **Coding on the Pipe:** HDPE and PVC pipe shall be colored at the point of manufacture. If black or white pipe must be used, pipe shall have City approved color coded ink lettering stamped on the pipe or shall be continuously taped with plastic adhesive tape using the color coding as stated above. Plastic adhesive tape shall be applied as follows:

Black and white 2-inch and 4-inch pipe -- continuously taped at top center.

Black and white 6-inch and larger pipe -- continuously taped at "10, 12, and 2 o'clock."
 Ductile iron pipe shall be continuously painted along the top one-third of the pipe with a 2-part high build epoxy-polyamide paint or approved equal. The paint shall be dry prior to the pipe being installed.

Ductile iron pipe wrapped in color coded polyethylene wrapping is not required to be painted.

2. **Coding above the Pipe:** Pipe shall have 3-inch detectable metallic tape of the proper color placed directly above the pipe and 12-inch below finished grade or 6-inch detectable tape between 12-inch and 24-inch below finished grade.

12.06.05 Valves and Valve Boxes

Valves shall be installed in a closed position, free from all distortion and strain, and left in satisfactory operating condition. Valves shall be tested in place by the Contractor, as far as practicable, and any defects in valves or connections shall be corrected to the satisfaction of the Engineer.



Tapping sleeves shall be pressure tested prior to making the tap.

Valve boxes with stay-put cover shall be vertical and concentric with the valve stem. Any valve box which is moved from its original position, preventing the operation of the valve stem, shall be satisfactorily reset by the Contractor at his expense.

Please see the Specifications for additional information for Valves.

12.06.06 Connections (Tie-ins) and Shutdowns

The Contractor shall furnish all labor and equipment necessary for the connection of approved pipelines to the existing system and the shutdown, removal or disconnection and plugging of existing pipelines as indicated on the Contract Drawings or as directed by the Engineer.

This may be required in instances where existing pipelines are to be abandoned or where a short segment of existing pipeline must be cut out and adjusted either vertically or horizontally to avoid a conflict with a proposed storm drain or storm drain structure, sanitary sewer, or other proposed improvement.

The Contractor shall make all taps and tie-ins required, under the direct observation of the Engineer.

12.07 PIPELINE CLEANING

The cleaning of the pipeline shall be done by the controlled and pressurized passage of a polyurethane pig of varying dimensions, coatings and densities as determined by the City through the piping system.

A series of pigs shall be entered into the system at a point as near to the beginning as is logistically and mechanically feasible.

A launching assembly shall be used as the entrance point for the pig. This assembly shall allow for the following:

1. The entering of pigs into the system by providing the means to induce flow from an external source, independent of the flows and pressures immediately available from the system, on the back of the pig to develop sufficient pressure to force the pig through the system.
2. A means to control and regulate the flow.
3. A means to monitor the flows and pressures.
4. A means to connect and disconnect from the system without any disruption to the operation of the system.

The pig shall be removed or discharged from the system at a point as near to the end as is logistically and mechanically feasible.

The contractor shall be responsible for the retrieval of the pig at the discharge point. This may include setting a trap that will not disrupt normal flow and operations but will capture the pig and any



debris. A retrieval assembly may also be used but said assembly shall be able to connect and disconnect from the system without any disruption to the operation of the system.

Alternative launching and retrieval methods shall be done with the prior approval of the City.

Any pig that cannot progress through the piping system shall be located by the contractor and removed by excavation of the pipe to remove the blockage. All pipe repairs shall be the responsibility of the contractor and shall be performed with as little disruption to the system as possible.

Any increase in pressure that cannot be accounted for, i.e. fittings or valves or additional cleaning runs, shall be investigated, per the Engineers' review and acceptance, by locating the pig at the beginning of the increased pressure and excavating to determine the cause of the pressure increase. All pipe repairs shall be the responsibility of the contractor and shall be performed with as little disruption to the system as possible.

Final flushing of the cleansed lines shall be performed after the last successful run of the pig as determined by the City. The contractor shall be responsible for all applicable flushing and disinfection requirements for potable water lines.

The contractor shall maintain and provide a report at the end of the cleaning procedure containing the following:

1. The pressures in the pipe during the pigging procedure.
2. Any inline problems encountered during the procedure including all excavations with detailed locations, reason for the excavation and any corrective measures taken to the pipeline.
3. A record of the pigs used, their sizes, styles and other pertinent information regarding what materials were used during the cleaning.
4. An analysis of the condition of the pipeline before and after the cleaning procedure.

12.08 TESTING AND DISINFECTION OF PRESSURE PIPELINES

All new pressure pipelines shall be subjected to a water pressure test between valves. In order to expedite the restoration of certain surface facilities, it may be required that individual sections between valves be tested as soon as the valves are installed. Disinfection shall be accomplished after the pressure test requirements have been met for the entire segment of pressure pipe.

The Contractor shall furnish all labor, materials, equipment, and chemicals to perform the required pressure tests and disinfection. All testing and disinfection will be subject to City inspection. All new valves shall be operated by the Contractor. However, all tie-in valves to the existing water system shall only be operated with the approval of, and in the presence of, the City, and shall be scheduled to be performed during the standard work hours of City staff, unless otherwise approved by the Engineer.

All existing valves shall be operated by the City or by the Contractor under the direct supervision of the City.



Testing and disinfection of pressure pipelines shall be completed per Flushing, Testing, and Disinfection section.

12.09 SURFACE RESTORATION AND MISCELLANEOUS

All surfaces disturbed by the Contractor shall be restored to their original condition in conformance to the Technical Specifications sections headed "Surface Restoration".

Sanitary sewers and laterals which cross a new potable water pipeline with less than 18 inches clear vertical separation, shall be replaced with 20 linear feet of ductile iron pipe, PVC pressure pipe (ANSI/AWWA C900-16), or SDR26 gravity pipe centered on the new pipeline, or as ordered by the Engineer.

Sanitary sewers and/or laterals which conflict with the new pipeline or are damaged by pipeline construction shall be reconstructed with ductile iron pipe, PVC pressure pipe (ANSI/AWWA C900-16), or SDR26 gravity pipe, as ordered by the Engineer.

Each valve box in an unpaved area shall have an 18-inch by 18-inch by 4-inch concrete pad. Pad shall be 1 inch above grade, and sod shall be so placed to maintain this 1 inch.

END OF SECTION



SECTION 15 - FLUSHING, TESTING AND DISINFECTION

15.01 WORK INCLUDED

- A. Flushing, Pressure Testing, and Disinfection of systems including, but not limited to, the pipelines shown in the Contract Documents.
- B. Contractor shall furnish all necessary pumps, hoses, piping, fittings, meters, gauges, chemicals and labor to conduct specified testing.
- C. Testing shall be repeated at the Contractor's expense until satisfactory results are achieved.

15.02 REFERENCES

- A. AWWA C651 - Standard for Disinfecting Water Mains.
- B. UNI-B-6 - Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe
- C. ASTM F1417 - Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
- D. AWWA C600 – Standards for Installation of Ductile-Iron Water Mains and Their Appurtenances.
- E. AWWA C605 - Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
- F. ASTM 2164 - Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure

15.03 SUBMITTALS

- A. Test Reports: Indicate results comparative to specified requirements. Submit two (2) copies of test results to Engineer in accordance with Submittal specifications.
- B. Final approval of the bacterial samples shall be received from the Florida Department of Environmental Protection prior to the time that the system is placed into operation. Sampling procedures shall be done in accordance with FDEP requirements.
- C. Bacteriological sampling locations shall meet FDEP requirements and be taken where shown on the drawings and as directed by the Engineer at no additional cost to Owner. Costs for all bacteriological testing shall be borne by the Contractor.

15.04 QUALITY ASSURANCE

- A. Perform Work in accordance with these specifications, applicable utility provider standards, and the applicable reference standards listed in Section 1.03 above.



15.05 REGULATORY REQUIREMENTS

- A. Conform to applicable FDEP requirements for performing the work of this Section.

15.06 DISINFECTION CHEMICALS

- A. Chemicals: The disinfecting agent shall be sodium hypochlorite solution ANSI/AWWA B303 or liquid chlorine ANSI/AWWA B301. Dry hypochlorite, similar to "HTH" or equal may also be used as the disinfecting agent. Bleach or Clorox is not acceptable.

15.07 FLUSHING AND PRESSURE TESTING - PIPING

The Contractor shall furnish and install suitable temporary testing plugs or caps for the water lines, all necessary pressure pumps, hose, pipe connections, meters, gauges and other similar equipment, and all labor required, all without additional compensation for conducting pressure and leakage tests and flushing of the new water lines. Flushing and pressure testing shall be conducted in the following order:

- A. After all piping lines have been installed and before pressure testing and final connections to equipment, each run of pipe shall be thoroughly flushed so as to remove all debris and foreign matter from the piping and equipment. Clean and flush all piping using potable water. Cleaning and Flushing shall be achieved by pigging with two (2) polyurethane foam pigs as manufactured by Girard Poly-Pig Inc. or "an approved equal". For watermain installation, the Contractor must ensure that there will be no contaminated water re-entering the main where the pig is flushed out, or it will be re-pigged at the Contractor's expense. Each pig will run through the line prior to running the second pig. On short runs (100 feet or less), or small lines (less than 4"), cleaning shall be accomplished by flushing with a minimum velocity of 2.5 feet per second. Contractor shall furnish and install required pig launch and exit assemblies. Non-abrasive pigs shall be employed. Flushed water may be discharged to the closest public catch basins and be coordinated with the City. Contractor to provide means of discharging water to catch basins at Contractor's expense.
- B. Pressure and leakage tests shall be conducted in the presence of the Engineer, or his representative. All pressure mains, fittings, water services, and appurtenances shall undergo pressure and leakage tests. The Contractor will provide all necessary apparatus including a suitable pressure gage, pump, measuring device, piping connections and fittings and the necessary labor to conduct the test. Leakage is defined as the quantity of water added to the pipe being tested during the test period. The Contractor shall submit to the Engineer the testing pattern he proposes to follow prior to testing for the Engineer's approval. The Contractor shall not test more than 1,500 feet of pipe in a single test without approval from the Engineer.
- C. In preparation for pressure testing the following parameters must be followed:
 - 1. All air must be vented from the pipeline prior to pressurization. This may be accomplished with the use of the air relief valves or corporation stop valves, vent piping in the testing hardware or end caps, or any other method which adequately allows air to escape the pipeline at all high points. Venting may also be



accomplished by 'flushing' the pipeline in accordance with the parameters and procedures as described in AWWA C600/C605.

2. The pipeline must be fully restrained prior to pressurization. This includes complete installation of all mechanical restraints per the restraint manufacturer's guidelines, whether permanent or temporary to the final installation. This also includes the installation and curing of any and all required thrust blocking. All appurtenances included in the pressure test, including valves, blow-offs, and air-relief valves shall be checked for proper installation and restraint prior to beginning the test.
3. Temporary pipeline alignments that are being tested, such as those that are partially installed in their permanent location shall be configured to minimize the amount of potentially trapped air in the pipeline.

15.07.01 PRESSURE TESTING DUCTILE IRON AND PVC PIPING SYSTEMS:

1. The test pressure for piping constructed of ductile iron and PVC pipe shall be a minimum of 150 psi and this pressure shall be maintained for a period of not less than two hours. Tests shall be made between valves and as far as practicable and as approved by the Engineer. Potable water from the distribution system shall be used. Pressure shall not vary more than five (5) psi for piping during the test periods or as approved by the Engineer. Additionally, allowable leakage shall be computed on the basis of AWWA C-600, C-605 where practical.
2. All leaks evident at the surface shall be uncovered and repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the Contractor's expense. Tests shall be repeated until leakage has been reduced below the allowable amount.
3. Should, in the judgment of the Engineer, it not be practical to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made as approved by the Engineer and the City.

15.07.02 PRESSURE TESTING HDPE PIPING SYSTEMS:

1. The HDPE pipe installed by the directional drill method shall be pressure tested after the entire length is installed.
2. The test pressure for all piping systems shall be a minimum of 150 psi and this pressure shall be maintained for a period of two hours. Testing procedure shall be in accordance with ASTM F2164 and generally as follows.
 - a. Take safety precautions as required and as specified in ASTM F2164.
 - b. Completely fill pipe with clean water and remove all air from pipe to be tested.
 - c. Allow water in pipe to equalize to a common temperature with surrounding ground/groundwater for 24 hours
 - d. With air removed and temperature equalized, gradually bring pipe being tested to test pressure plus 10 psi. If test pressure cannot be achieved, discontinue testing and correct fault.



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- e. Add make-up liquid as required to maintain test pressure plus 10 psi over a 4 hour period.
- f. Test Phase - Immediately following the end of the 4 hour period, reduce pressure by 10 psi and monitor pressure for 1 hour. Do not increase pressure or add make up water.
- g. Pass/Fail Criteria - If no leakage is observed, and pressure during the test phase remains steady (within 5% of the test pressure) for the 1 hour test phase period, a passing test is indicated.
- h. Retesting – If retesting is necessary, depressurize the test section in accordance with ASTM F2164 and correct any faults. Do not attempt to correct any faults while the system is under pressure.
- i. Allow the test section to “relax” for at least 8 hours before re-pressurizing. After the relaxation period, repeat the initial expansion and test phases as described above.
- j. All leaks shall be repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and re placed at the Contractor’s expense. Tests shall be repeated until leakage has been reduced below the allowable amount.
- k. All visible leaks shall be repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the Contractor’s expense. Tests shall be repeated until leakage has been reduced below the allowable amount.
- l. Should, in the judgment of the Engineer, it not be practical to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made as approved by the Engineer. In any event, the Contractor shall be responsible for the ultimate tightness of the watermain within the preceding requirements.

15.07.03 PRESSURE TESTING FUSIBLE PVC SYSTEMS:

- 1. Fusible PVC pipe installed by the directional drill method shall be pressure tested after the entire length is installed.
- 2. The test pressure for the water piping constructed fusible PVC pipe shall be a minimum of 150 psi. This pressure shall be maintained for a period of not less than two hours. Tests shall be made between valves and as far as practicable and as approved by the Engineer. Potable water from the distribution system shall be used. Pressure shall not vary more than five (5) psi for piping during the test periods or as approved by the Engineer. Additionally, allowable leakage shall be computed on the basis of AWWA C-600, C-605 where practical.
- 3. All leaks evident at the surface shall be uncovered and repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the Contractor's expense. Tests shall be repeated until leakage has been reduced below the allowable amount.



4. Should, in the judgment of the Engineer, it not be practical to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made as approved by the Engineer and the City. In any event, the Contractor shall be responsible for the ultimate water tightness of the piping within the preceding requirements

15.07.04 LEAKAGE TESTING FOR NON-PRESSURE PIPING

- A. Gravity sanitary sewers need to be tested for leakage.
- B. Gravity sanitary sewer leakage testing may include appropriate water or low pressure air testing. The leakage outward or inward (exfiltration or infiltration) shall not exceed 25 gallons per inch of pipe diameter per mile per day for any section of the system. An exfiltration or infiltration test shall be performed with a minimum positive head of two feet. The air test, if used, shall be conducted in accordance with one of the following Standards:
 1. ASTM F1417
 2. UNI-B-6
- C. The testing method selected shall properly consider the existing groundwater elevations during the test.

15.07.05 DEFLECTION TESTING FOR NON-PRESSURE PIPING

- D. After completion of the backfill, the engineer or owner may require that a deflection test be performed.
- E. Deflection tests should be conducted using a go/no-go mandrel. The mandrel's outside dimension shall be sized to permit no more than 7.5 percent deflection. The percent deflection shall be established from the base inside diameter of the pipe. If the internal beading of the fused joints for the pipe is not required to be removed, the mandrel shall account for this clearance as well. The mandrel shall be approved by the owner or engineer prior to use. Lines that permit safe entry may allow other deflection test options, such as direct measurements.

15.08 DISINFECTION FOR WATER MAIN INSTALLATION

- A. The Contractor shall furnish and install suitable temporary connections to the piping, all necessary pressure pumps, hose, pipe connections, meters, gauges and other similar equipment, and all labor required, all without additional compensation for the disinfection of all required potable water piping systems. Disinfection shall be in accordance with the City. If no standards exist, disinfection shall be conducted on the following systems in the following manner:
 1. All relocated and new potable water and private fire line piping.
- B. Conform to AWWA Standards and as modified herein.
- C. Maintain disinfectant for a minimum of 8 hours in such a manner that the entire system will be filled with water containing a minimum chlorine concentration of 50 ppm at any point.



- D. After the disinfecting agents have been permitted to remain for the specified contact periods, the water lines, and valves shall be thoroughly flushed with water until the residual chlorine tests are less than 4 PPM in each instance. The determination of the amount of residual chlorine in the system shall be made at such points and in accord with standard tests by means of a standard orthotolodine test set.
- E. Replace permanent system devices removed for disinfection.

15.09 BACTERIOLOGICAL SAMPLING FOR WATER MAIN INSTALLATION

- A. It shall be the responsibility of the Contractor under this contract to perform the bacteriological testing required by the Florida Department of Environmental Protection and the City to obtain clearance of all piping. The Contractor shall be responsible to disinfect and repeat testing as needed until clearance is obtained for all required systems. The Contractor shall be responsible to pay for additional water needed if the bacteriological testing must be repeated.
- B. The piping requires two (2) passing consecutive daily samples taken from the locations called out on the plans or as determined by the Engineer. The samples shall be taken concurrently at all the respective sample point locations.
- C. Sampling must be coordinated with Engineer and other construction activities so as to minimize re-sampling.
- D. Contractor shall submit schedule for bacteriological testing and pressure tests.
- E. The Contractor shall incur all costs needed to provide bacteriological clearance of the piping systems.
- F. If repeated tests of such samples show the presence of coliform organisms, the disinfection shall be repeated until tests indicate an absence of contamination.

15.10 QUALITY CONTROL

- A. The laboratory and personnel collecting bacteriological samples shall be Florida State certified in accordance with FDEP requirements.

15.11 CONNECTIONS TO EXISTING MAINS

- A. The Contractor shall make connections to existing mains as shown on the drawings only after the new mains have passed their pressure and leakage test and completed the disinfection and bacteriological clearance procedures as required.

END OF SECTION



SECTION 16 - SANITARY SEWER BYPASS PUMPING

16.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals required to maintain existing and anticipated flows within the affected portion of the collection system throughout the construction period.

16.02 PUBLIC IMPACTS

The contractor shall not create a public nuisance due to excessive noise or dust, nor impact the public with flooding of adjacent lands, discharge of raw sewage, or release of other potential hazards, nor shall he encroach on or limit access to adjacent lands. No extra charge may be made for increased costs to the contractor due to any of the above.

16.03 SUBMITTALS

The Contractor shall, within 30 days of the date of the Notice to Proceed, submit to the Project Manager a detailed Bypass Pumping Plan for each site by-pass pumping will be needed. The Bypass Pumping Plan shall address all measures and systems to prevent a sanitary sewer overflow (SSO) as defined by the EPA. The Plan shall include as a minimum:

- A. Working drawings and sketches showing work location, pump location, piping layout & routing. Show all proposed encroachment and access impacts on adjacent properties or facilities.
- B. Pump, control, alarm and pipe specifications or catalog cuts. Detailed sketch of controls and alarm system.
- C. Power requirements and details on methods to provide by-pass power or fueling.
- D. Calculation and determination of response times to prevent an SSO after a high-water alarm.
- E. Procedures to be taken in case of power, pump, or piping failures; including contact names and numbers for emergency notifications.
- F. Frequency and specific responsibility for monitoring pump operation, fuel levels, pump maintenance and entire length of piping.

16.04 EQUIPMENT

- A. Pumps:
 - 1. By-pass pumping system shall consist of at least a primary pump and a backup pump. Each pump shall have a minimum pumping capacity of 150% of the anticipated peak flows. When bypassing a pump station, 150% of the lift station capacity (G.P.M. & T.D.H) shall be provided.
 - 2. Pumps shall be low noise or sound attenuated. The noise level at any operating condition, in any direction, shall not exceed 70dBA at a distance of twenty-three (23) feet (7 meters) from the pump and/or power source.



B. Controls:

The by-pass pump system shall be equipped with automatic controls and an alarm system. The automatic controls will automatically start the backup pump in the event of a high-water condition or failure of the primary pump. The alarm system will immediately notify the Contractor of a pump failure or high-water condition.

C. Pipe:

Pipe shall be of adequate size and capacity to match the pumps. Pipe type and materials will depend on the particulars of the site conditions and shall be detailed in the Bypass Pumping Plan. Contractor will provide all connections.

16.05 SITE CONDITIONS

Site conditions will vary by site. Contractor is responsible to determine and address requirements such as traffic control, excavation, connections & fittings, impacts on access to adjacent properties, routing and support of by-pass piping, etc., in the Bypass Pumping Plan.

16.06 ON-SITE MONITORING

- A. The Contractor shall have personnel experienced with the pumps and controls on site within the calculated response time to prevent an SSO after a high-water alarm.
- B. During by-pass operations, the Contractor shall have posted on site with the permit, a copy of the approved Plan and the name and 24-hour contact number of the primary response person, the job site superintendent, and the construction company owner.

16.07 OPERATIONS

- A. The Contractor is responsible for securing and providing power, fuel, site security, traffic control and all other supplies, materials and permits required for the by-pass pumping.
- B. Contractor shall demonstrate automatic pump switching and alarm system to the satisfaction of the City of St. Pete Beach, prior to beginning by-pass pumping.

Satisfactory demonstration shall be documented by the engineer's, PM's or the City's dated signature on the posted copy of the approved Bypass Pumping Plan.



16.08 DAMAGE RESTORATION & REMEDIATION

- A. The Contractor shall be responsible for any pre-pump notifications, all restoration of pre-pump conditions and any damage caused by by-pass operations.
- B. Should there be an SSO caused by or as a direct result of the by-pass pumping, the contractor is responsible for all immediate & long term response, notifications, clean up, mitigation, etc. Copies of all written response plans, notifications, documentation, mitigation plans, etc., shall be submitted to the City.

END OF SECTION



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SECTION 17 - VALVES AND APPURTENANCES

17.01 GENERAL

17.01.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Contract Drawings and as specified herein.

All valves and appurtenances shall be of the size shown on the Contract Drawings and, to the extent possible, all equipment of the same type on the Project shall be from one manufacturer.

All valves and appurtenances shall have the name of the manufacturer and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.

All valves shall have a factory applied, fusion bonded epoxy coating on interior and exterior unless noted otherwise in the Contract Drawings or the Specifications.

All bolts, nuts, washers, and other trim hardware shall be 316 stainless steel hardware must be 316 SS unless otherwise noted and reviewed by the Engineer.

The equipment shall include, but not be limited to, the following:

1. Gate Valves (Sec. 17.03)
2. Pressure Sustaining and Check Valves (Sec. 17.04)
3. Ball Valves for PVC Pipe (Sec. 17.05)
4. Butterfly Valves (Sec. 17.06)
5. Plug Valves (Sec. 17.07)
6. Valve Actuators (Sec. 17.08)
7. Air Release Valves (Sec. 17.09)
8. Valves Boxes (Sec. 17.10)
9. Corporation Cocks (Sec. 17.11)
10. Flange Adapter Couplings (Sec. 17.12)
11. Flexible Couplings (Sec. 17.13)
12. Hose Bibs (Sec. 17.14)
13. Check Valves (Sec. 17.15)
14. Hydrants (Sec. 17.16)
15. Tapping Sleeves and Tapping Valves (Sec. 17.17)

17.01.02 DESCRIPTION OF SYSTEMS

All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of potable water, reclaim water, wastewater, etc., depending on the applications.



17.01.03 QUALIFICATIONS

All of the types of valves and appurtenances shall be products of well-established reputable firms who are fully experienced and qualified in the manufacture of the particular equipment 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 as applicable. Valves shall be as covered under mechanical devices in Section 8 of ANSI/NSF Standard 61.

17.01.04 SUBMITTALS

Submittals shall conform to the following:

- A. Submit to the City within 30 days after execution of the contract a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.
- B. Complete shop drawings of all valves and appurtenances shall be submitted to the City and Engineer for review and acceptance in accordance with the Specifications.

17.02 TOOLS

Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

17.03 GATE VALVES

Gate Valves shall conform to the following:

- A. All buried valves shall have cast or ductile iron three (3) piece valve bodies.
- B. Where indicated on the Contract Drawings or necessary due to locations, size, or inaccessibility, chain wheel operators shall be furnished with the valves. Such operators shall be designed with adequate strength for the valves with which they are supplied and provide for easy operation of the valve. Chains for valve operators shall be galvanized.
- C. Where required, gate valves shall be provided with a box cast in a concrete slab and a box cover. Length of box shall include slab thickness. Box cover opening shall be for valve stem and nut. Valve wrenches and extension stems shall be provided by the manufacturer to actuate the valves. The floor box and cover shall be equal to those manufactured by Rodney Hunt Machine Company, Orange, Massachusetts, Clow, DeZurik or approved equal.
- D. Gate valves with 3inch-20inch diameters shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C509 or C515 and UL/FM of latest revision and in accordance with the following specifications. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve.



- E. Wrench nut shall be provided for operating the valve.
- F. Valves shall be suitable for an operating pressure of 200 psi and shall be tested in accordance with AWWA C509 or C515. Mueller, Kennedy, M&H, and Clow are acceptable valves.
- G. All exterior bonnet bolts, nuts and studs shall be 316 stainless steel.

17.04 PRESSURE SUSTAINING AND CHECK VALVE

Pressure sustaining and check valves shall conform to the following:

- A. Pressure sustaining and check valve shall be pilot operated diaphragm actuated valve with cast iron body, bronze trim, and 125-pound flanged ends. The valve shall be hydraulically operated, diaphragm type globe valve. The main valve shall have a single removable seat and a resilient disc, of rectangular cross section, surrounded on three and a half sides. The stainless-steel stem shall be fully guided at both ends by a bearing in the valve cover, and an integral bearing in the valve seat. It shall be sleeved at both ends with delrin. No external packing glands are permitted and there shall be no pistons operating the main valve or any controls. The valve shall be equipped with isolation cocks to service the pilot system while permitting flow if necessary. Main valve and all pilot controls shall be manufactured in the United States of America. Valve shall be single chamber type, with seat cut to 5 degrees taper.
- B. Valve shall maintain a minimum (adjustable) upstream pressure to a preset (adjustable) maximum. The pilot system shall consist of two direct acting, adjustable, spring loaded diaphragm valves.
- C. Valve shall be cast iron (ASTM A48) with main valve trim of brass (QQB-B-626) and bronze (ASTM B61). The pilot control valves shall be cast brass (ASTM B62) with 303 stainless steel trim. All ferrous surfaces inside and outside shall have a 2-part epoxy coating. Valve shall be similar in all respects to CLA-VAL Company, Model 692G-01ABKG, as manufactured by CLA-VAL Company, Winter Park, Florida, or similar pressure sustaining and check valve as manufactured by Golden Alderson; or approved equal.

17.05 BALL VALVES FOR PVC PIPE

Ball valves shall conform to the following:

- A. Ball valves for PVC pipe shall be of PVC Type 1 with union, socket, threaded or flanged ends as required. Ball valves shall be full port, full flow, all plastic construction, 150 psi rated with Teflon seat seals and T-handles. PVC ball valves shall be as manufactured by Celanese Piping Systems, Inc., Wallace and Tiernan, Inc., Plastiline, Inc., or approved equal.



- B. All valves shall be mounted in such a position that valve position indicators are plainly visible when standing on the floor.

17.06 BUTTERFLY VALVES

Butterfly valves shall conform to the following:

- A. Butterfly valves shall conform to the AWWA Standard Specifications for Rubber Seated Butterfly Valves, Designated C504, except as hereinafter specified. Valves, except as specified hereinafter, shall be Class 150A or B, except that valves furnished downstream of the high service pumps shall be Class 250 and equal to those manufactured by Henry Pratt Company, DeZurik, Mueller, or approved equal. M&H/Kennedy/Clow are not generally approved equals. Ductile iron conforming to ASTM A536, Grade 65-45-12 shall be provided for all Class 250 valves. All valves shall be leak tested at 200 psi.
- B. The face-to-face dimensions of flanged end valves shall be in accordance with Table 1 of above mentioned AWWA Specification for short-body valve. Adequate two-way thrust bearings shall be provided. Flange drilling shall be in accordance with ANSI B16.1.
- C. Valve seats shall be an EPDM elastomer. Valve seats 24 inches and larger shall be field adjustable and replaceable without dismounting operator disc or shaft and without removing the valve from the line. All retaining segments and adjusting devices shall be of corrosion resistant material with stainless Nylock screws and be capable of the 1/8-inch adjustment. Valves 20 inches and smaller shall have bonded or mechanically restrained seats as outlined in AWWA C 504. Where the EPDM seat is mounted on the valve body, the mating edge of the valve disc shall be 18-8 stainless steel or Nickel-Chrome, 80-20%. Where the EPDM seat is mounted on the valve disc, the valve body shall be fitted with an 18-8 stainless steel seat offset from the shaft, mechanically restrained and covering 360 degrees of the peripheral opening or seating surface.
- D. The valve body shall be constructed of ductile iron or close grain cast iron per ASTM A126, Class B with integrally cast hubs for shaft bearing housings of the through boss-type. Butterfly valves of the "wafer" or "spool" type will not be accepted.
- E. The valve shaft shall be turned, ground, and polished constructed of 18-8, ASTM A-276, Type 304 stainless steel and designed for both torsional and shearing stresses when the valve is operated under its greatest dynamic or seating torque. Shaft shall be of either a one-piece unit extending full size through the valve disc and valve bearing or it may be of a stub shaft design. Shaft bearings shall be Teflon or nylon, self-lubricated type.
- F. All valves shall be subject to hydrostatic and leakage tests at the point of manufacture. The hydrostatic test for Class 250 valves shall be performed with an internal hydrostatic pressure equal to 500 psi applied to the inside of the valve body of each valve for a period of five minutes. During the hydrostatic test, there shall be no leakage through the metal, the end joints or the valve shaft seal. The leakage test for the Class 250 valves shall be performed at a differential pressure of 230 psi and against both sides of the valve. No adjustment of the valve disc shall be necessary after pressure test for normal



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operation of valve. The Class 150 valves shall be tested in conformance with AWWA C-504.

- G. In general, the butterfly valve operators shall conform to the requirements of Section 3.8 of the AWWA Standard Specifications for Rubber Seated Butterfly Valves, Designation C504, insofar as applicable, and as herein specified.
- H. Gearing for the operators shall be totally enclosed in a gear case in accordance with paragraph 3.8.3 of the above mentioned AWWA Standard Specification.
- I. Operators shall be capable of seating and unseating the disc against the full design pressure of velocity, as specified for each class, into a dry system downstream and shall transmit a minimum torque to the valve. Operators shall be rigidly attached to the valve body.
- J. The manufacturer shall certify that the required tests on the various materials and on the completed valves have been satisfactory and that the valves conform with all requirements of this Specification and the AWWA standard.
- K. Where indicated on the Contract Drawings, extension stems, floor stands, couplings, stem guides, and floor boxes as required shall be furnished and installed.

17.07 PLUG VALVES

Plug valves shall conform to the following:

- A. All plug valves shall be eccentric plug valves capable of sustaining 150 psi in either direction without leaking.

Exception: Single direction plug valves may be used if it is clearly demonstrated they will never be required to resist pressure in both directions either in service or during pipe line testing.
- B. Plug valves shall be tested in accordance with current AWWA Standard C-504-80 Section 5. Each valve shall be performance tested in accordance with paragraph 5.2 and shall be given a leakage test and hydrostatic test as described in paragraphs 5.3 and 5.4. Plug valves shall be Kennedy, Dezurik, or approved equal.
- C. Plug valves shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with end connections as shown on the Contract Drawings. Flanged valves shall be faced and drilled to the ANSI 150 lb. standard. Mechanical joint ends shall be to the AWWA Standard C111-72. Bell ends shall be to the AWWA Standard C100-55 Class B. Screwed ends shall be to the NPT standard.
- D. Plug valve bodies shall be of ASTM A126 Class B Semi-steel, 31,000 psi tensile strength minimum in compliance with AWWA Standard C507-73, Section 5.1 and AWWA Standard C504-70 Section 6.4. Port areas for valves 20-inches and smaller shall



be full port 100 percent of full pipe area. Valves 24-inch and larger shall have a minimum port area between 80 and 100 percent of full nominal pipe area. All exposed nuts, bolts, springs, washers, etc. shall be 316 stainless steel. Resilient plug facings shall be of Hycar or Neoprene.

- E. Plug valves shall be furnished with permanently lubricated stainless steel or oil-impregnated bronze upper and lower plug stem bushings. These bearings shall comply with current AWWA Standards.

17.08 VALVE ACTUATORS

17.08.01 GENERAL

- A. All valve actuators shall conform to Section 3.8 of the AWWA Standard Specification and shall be either manual or motor operated.
- B. Actuators shall be capable of seating and unseating the disc against the full design pressure and velocity, as specified for each class, into a dry system downstream, and shall transmit a minimum torque to the valve. Actuators shall be rigidly attached to the valve body.
- C. Butterfly valve actuators shall conform to the requirements of Section 3.8 of the AWWA Standard specifications for Rubber Seated Butterfly Valves, Designated C504, insofar as applicable and as herein specified.

17.08.02 MANUAL ACTUATORS

- A. Manual actuators shall have permanently lubricated, totally enclosed gearing with handwheel and gear ratio sized on the basis of actual line pressure and velocities. Actuators shall be equipped with handwheel, position indicator, and mechanical stop-limiting locking devices to prevent over travel of the disc in the open and closed positions. They shall turn counter-clockwise to open valves. Manual actuators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Actuators shall be fully enclosed and designed to produce the specified torque with a maximum pull of 80 pounds on the handwheel or chainwheel. Actuator components shall withstand an input of 450 foot pounds for 30-inch and smaller and 300 foot pounds for larger than 30-inch size valves at extreme actuator positions without damage. Valves located above grade shall have handwheel and position indicator, and valves located below grade shall be equipped with a 2-inch square AWWA operating nut located at ground level and cast-iron extension type valve box. Valve actuators shall conform to AWWA C504, latest revision.

17.08.03 MOTOR ACTUATORS (MODULATING)

- A. The motor actuated valve controller shall include the motor, actuator unit gearing,



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limit switch gearing, limit switches, position transmitter which shall transmit a 4-20 mA DC signal, control power transformer, electronic controller which will position the valve based on a remote 4-20 milliamp signal, torque switches, bored and key-wayed drive sleeve for non-rising stem valves, declutch lever and auxiliary handwheel as a self-contained unit.

- B. The motor shall be specifically designed for valve actuator service using 480-volt, 60 Hertz, three phase power as shown, on the electrical drawings. The motor shall be sized to provide an output torque and shall be the totally enclosed, non-ventilated type. The power gearing shall consist of helical gears fabricated from heat treated alloy steel forming the first stage of reduction. The second reduction stage shall be a single stage worm gear. The worm shall be of alloy steel with carburized threads hardened and ground for high efficiency. The worm gear shall be of high tensile strength bronze with hobbled teeth. All power gearing shall be grease lubricated. Ball or roller bearings shall be used throughout. Preference will be given to units having a minimum number of gears and moving parts. Spur gear reduction shall be provided as required.
- C. Limit switches and gearing shall be an integral part of the valve control. The limit switch gearing shall be made of bronze and shall be grease lubricated, intermittent type and totally enclosed to prevent dirt and foreign matter from entering the gear train. Limit switches shall be of the adjustable type capable of being adjusted to trip at any point between fully opened valve and fully closed valve.
- D. The speed of the actuator shall be the responsibility of the system supplier with regard to hydraulic requirements and response compatibility with other components within the control loop. Each valve controller shall be provided with a minimum of two rotor type gear limit switches, one for opening and one for closing. The rotor type gear limit switch shall have two normally open and two normally closed contacts per rotor. Gear limit switches must be geared to the driving mechanism and in step at all times whether in motor or manual operation. Provision shall be made for two additional rotors as described above, each to have two normally open and two normally closed contacts. Each valve controller shall be equipped with a double torque switch. The torque switch shall be adjustable and will be responsive to load encountered in either direction of travel. It shall operate during the complete cycle without auxiliary relays or devices to protect the valve, should excessive load be met by obstructions in either direction of travel. The torque switch shall be provided with double-pole contacts.
- E. A permanently mounted handwheel shall be provided for manual operation. The handwheel shall not rotate during electric operations but must be responsive to manual operation at all times except when being electrically operated. The motor shall not rotate during hand operation nor shall a fused motor prevent manual operation. When in manual operating position, the unit will remain in this position until motor is energized at which time the valve operator will automatically return to electric operation and shall remain in motor position until handwheel operation



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is desired. This movement from motor operation to handwheel operation shall be accomplished by a positive declutching lever which will disengage the motor and motor gearing mechanically, but not electrically. Hand operation must be reasonably fast. It shall be impossible to place the unit in manual operation when the motor is running. The gear limit switches and torque switches shall be housed in a single easily accessible compartment integral with the power compartment of the valve control. All wiring shall be accessible through this compartment. Stepping motor drives will not be acceptable.

- F. The motor with its control module must be capable of continuously modulating over its entire range without interruption by heat protection devices. The system, including the operator and control module must be able to function, without override protection of any kind, down to zero dead zone.
- G. All units shall have strip heaters in both the motor and limit switch compartments.
- H. The actuator shall be equipped with open-stop-close push buttons, an auto-manual selector switch, and indicating lights, all mounted on the actuator or on a separate locally mounted power control station.
- I. The electronics for the electric operator shall be protected against temporary submergence.
- J. Actuators shall be Limitorque L120 with Modutronic Control System containing a position transmitter with a 4-20MA output signal or equal.

17.08.04 MOTOR ACTUATORS (OPEN-CLOSE)

- A. The electronic motor-driven valve actuator shall include the motor, actuator gearing, limit switch gearing, limit switches, torque switches, fully machined drive sleeve, declutch lever, and auxiliary handwheel as a self-contained unit.
- B. The motor shall be specifically designed for valve actuator service and shall be of high torque totally enclosed, nonventilated construction, with motor leads brought into the limit switch compartment without having external piping or conduit box.
 - a) The motor shall be of sufficient size to open or close the valve against maximum differential pressure when voltage to motor terminals is 10% above or below nominal voltage.
 - b) The motor shall be prelubricated and all bearings shall be of the anti-friction type.
- C. The power gearing shall consist of helical gears fabricated from heat treated steel and worm gearing. The worm shall be carburized and hardened alloy steel with the threads ground after heat treating. The worm gear shall be of alloy bronze accurately cut with a hobbing machine. All power gearing shall be grease lubricated. Ball or roller bearings shall be used throughout.



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- D. Limit switches and gearing shall be an integral part of the valve actuator. The switches shall be of the adjustable rotor type capable of being adjusted to trip at any point between fully opened valve and fully closed valve. Each valve controller shall be provided with a minimum of two rotor type gear limit switches, one for opening and one for closing (influent valves require additional contacts to allow stopping at an intermediate position). The rotor type gear limit switch shall have two normally open and two normally closed contacts per rotor. Additional switches shall be provided if shown on the control and/or instrumentation diagrams. Limit switches shall be geared to the driving mechanism and in step at all times whether in motor or manual operation. Each valve actuator shall be equipped with a double torque switch. The torque switch shall be adjustable and will be responsive to load encountered in either direction of travel. It shall operate during the complete cycle without auxiliary relays or devices to protect the valve should excessive load be met by obstructions in either direction of travel. Travel and thrusts shall be independent of wear in valve disc or seat rings.
- E. A permanently mounted handwheel shall be provided for manual operation. The handwheel shall not rotate during electric operation except when being electrically operated. The motor shall not rotate during hand operation, nor shall a fused motor prevent manual operation. When in manual operating position, the unit will remain in this position until motor is energized at which time the valve actuator will automatically return to electric operation and shall remain in motor position until handwheel operation is desired. Movement from motor operation to handwheel operation shall be accomplished by a positive declutching lever which will disengage the motor and motor gearing mechanically, but not electrically. Hand operation must be reasonably fast. It shall be impossible to place the unit in manual operation when the motor is running.
- F. Valve actuators shall be equipped with an integral reversing controller and three phase overload relays, Open-Stop-Close push buttons, local-remote-manual selector switch, control circuit transformer, three-phase thermal overload relays and two pilot lights in a NEMA 4X enclosure. In addition to the above, a close coupled air circuit breaker or disconnect switch shall be mounted and wired to the valve input power terminals for the purpose of disconnecting all underground phase conductors.
- G. The valve actuator shall be capable of being controlled locally or remotely via a selector switch integral with the actuator. In addition, an auxiliary dry contact shall be provided for remote position feedback.
- H. Valve A.C. motors shall be designed for operation on a 480 volt, 3-phase service. Valve control circuit shall operate from a fuse protected 120-volt power supply.
- I. Motor operators shall be as manufactured by Limitorque Corporation, Type L120 or approved equal.



17.09 AIR RELEASE VALVES

The air release valves for use in water or force mains shall be installed as shown on the Contract Drawings. The valves shall have a 316 stainless steel body and cover, 316 stainless steel float, plug, seat ring, and internal mechanism, bronze water diffuser, Buna-N or Viton seat, and 316 stainless steel trim and hardware. The fittings shall be threaded. Back flushing attachments shall be included. The air release valves shall be Figure 942 or 942F as manufactured by VAG/GA Industries or approved equal.

17.10 VALVE BOXES

Valve Boxes shall conform to the following:

- A. Buried valves shall have cast-iron three-piece valve boxes or HDPE adjustable valve boxes. Cast iron valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at or slightly above the finished grade surface as directed by the City. The barrel shall be two-piece, screw type, having a 5 1/4-inch shaft. The upper section shall have a flange at the bottom with sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall have WATER, SEWER, or RECLAIM, as applicable, cast into the top. Lids will be painted “safety” blue for potable, purple for reclaimed, and green for sanitary sewer.
- B. All valves shall have actuating nuts extended to within four (4) feet of the top of the valve box. All valve extensions will have a centering guide plate two (2) inches maximum below the actuating nut. The valve extension shall be fastened to the existing nut with a set screw. Valve boxes shall be provided with a concrete base and a valve nameplate engraved with lettering 1/8-inch deep as shown on the Contract Drawings.
- C. HDPE adjustable valve boxes shall be one complete assembled unit composed of the valve box and extension stem. All moving parts of the extension stem shall be enclosed in a housing to prevent contact with the soil. Valve box assembly shall be adjustable to accommodate variable trench depths.
- D. The entire assembly shall be made of heavy wall high density polyethylene. All exterior components shall be joined with 316 stainless steel screws. The valve box top section shall be adaptable to fit inside a valve box upper section.
- E. The stem assembly shall be of a telescoping design that allows for variable adjustment length. The stem material shall be of plated steel square tubing. The stem assembly shall have a built-in device that keeps the stem assembly from disengaging at its fully extended length. The extension stem must be torque tested to 1000 foot pounds. Covers shall have WATER, SEWER or RECLAIMED clearly and permanently impressed into the top surface.

17.11 CORPORATION COCKS

Corporation cocks for connections to cast-iron, ductile iron or steel piping shall be all brass or bronze suitable for 180 psi operating pressure and similar to Mueller Co. H-10046 or approved



equal by Clow Corp. and shall be of sizes required and/or noted on the Contract Drawings.

17.12 FLANGE ADAPTER COUPLINGS

Flange adapter couplings shall be of the size and pressure rating required for each installation and shall be suitable for use on either cast iron or ductile iron pipe. They shall be similar or approved equal to Dresser Company, Style 128. All couplings shall have a sufficient number of factory installed anchor studs to meet or exceed a minimum test pressure rating of 230 psi minimum.

17.13 FLEXIBLE COUPLINGS

- A. Flexible couplings shall be either the split type or the sleeve type as shown on the Contract Drawings.
- B. Split type coupling shall be used with all interior piping and with exterior piping noted on the Contract Drawings. The couplings shall be mechanical type for radius groove piping. The couplings shall mechanically engage and lock grooved pipe ends in a positive couple and allow for angular deflection and contracting and expansion.
- C. Couplings shall consist of malleable iron, ASTM Specification A47, Grade 32510 housing clamps in two or more parts, a single chlorinated butyl composition sealing gasket with a "C" shaped cross-section and internal sealing lips projecting diagonally inward, and two or more oval track head type bolts with hexagonal heavy nuts conforming to ASTM Specification A 183 and A194 to assemble the housing clamps. Bolts and nuts shall be 316 stainless steel.
- D. Victaulic type couplings and fittings may be used in lieu of flanged joints. Pipes shall be radius grooved as specified for use with the Victaulic couplings. Flanged adapter connections at fittings, valves, and equipment shall be Victaulic Vic Flange Style 741, equal by Gustin-Bacon Group, Division of Certain-Teed Products, Kansas City, Kansas, or approved equal.
- E. Sleeve type couplings shall be used with all buried piping. The couplings shall be of steel and shall be Dresser Style 38 or 40, as shown on the Contract Drawings, or equal. The coupling shall be provided with 316 stainless steel bolts and nuts unless indicated otherwise.
- F. All couplings shall be furnished with the pipe stop removed.
- G. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
- H. If the Contractor decides to use victaulic couplings in lieu of flanged joints, he shall be responsible for supplying supports for the joints.



17.14 HOSE BIBS

Hose bibs shall be 3/4-inch or 1-inch brass, polished chromium plated brass, with vacuum breaker as noted on the Contract Drawings.

17.15 CHECK VALVES

- A. Check valves for cast iron and ductile iron pipe lines shall be swing type and shall meet the material requirements of AWWA Specification C508. The valves shall be iron body, bronze mounted, single disc, 175 psi working water pressure and nonshock. Valves shall be as manufactured by Mueller, Clow, Kennedy, or M&H. Valves 8-inch and larger shall be air cushioned to reduce valve slam.
- B. When there is no flow through the line, the disc shall hang lightly against its seat in practically a vertical position. When open, the disc shall swing clear of the waterway.
- C. Check valves shall have bronze seat and body rings, extended bronze or 316 stainless steel hinge pins and 316 stainless steel nuts on the bolts of bolted covers. The interior and exterior of the valve body shall have a factory applied fusion bonded or 10 mil 2-part epoxy coating (Protecto 401 or approved equal).
- D. Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and weight. The hinge arm and weight, along with hardware, shall be suitable for use in a corrosive environment.

17.16 HYDRANTS

Hydrants shall be provided and installed as required by Pinellas County Utility Specifications.

17.17 TAPPING SLEEVES AND TAPPING VALVES

Tapping valves shall meet the requirement of AWWA C500. The valves shall be flanged, shall be mechanical joint outlet with non-rising stem, designed for vertical burial and shall open left or counterclockwise. Stuffing boxes shall be the "O-ring" type. Operating nut shall be AWWA Standard 2-inch square for valves 2-inch and up. The valves shall be provided with an overload seat to permit the use of full size cutters. Gaskets shall cover the entire area of flange surfaces and shall be supplied with EPDM wedges up to 30-inch diameter.

Tapping sleeves and saddles shall seal to the pipe by the use of a confined "O" ring gasket and shall be able to withstand a pressure test of 180 psi for water lines or 150 psi for sewer force mains for one hour with no leakage in accordance with AWWA C110, latest edition. A 316 stainless steel 3/4-inch NPT test plug shall be provided for pressure testing. All hardware joining the two halves shall be 316 stainless steel and shall be included with the sleeve or saddle. Tapping sleeves and saddle straps shall be made of 316 stainless steel.



17.18 INSTALLATION

- A. All valves and appurtenances shall be installed in the location shown, true to alignment and rigidly supported. Any damage occurring to the above items before they are installed shall be repaired to the satisfaction of the City.
- B. After installation, all valves and appurtenances shall be tested at least two hours at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the City.
- C. Install all floor boxes, brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Contract Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all Contract Documents which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.
- D. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections.
- E. Flanged joints shall be made with 316 stainless steel bolts, nuts and washers. Mechanical joints shall be made with 316 stainless steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All buried bolts and nuts shall be heavily coated with two (2) coats of bituminous paint comparable to Inertol No. 66 Special Heavy.
- F. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.
- G. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8-inch. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of 6-inches from the end.
- H. Valve boxes with concrete bases shall be installed as shown on the Contract Drawings. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Place cast iron box over each stem with base bearing on compacted fill and the top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box.



17.19 SHOP PAINTING

Ferrous surfaces of valves and appurtenances shall receive a coating of rust-inhibitive primer. All pipe connection openings shall be capped to prevent the entry of foreign matter prior to installation.

17.20 FIELD PAINTING

All metal valves and appurtenances specified herein and exposed to view shall be painted according to the Specifications. All above ground potable water main valves shall be painted safety blue.

17.21 INSPECTION AND TESTING

Completed pipe shall be subjected to hydrostatic pressure test for two hours at 180 psi for water and 150 psi for sewer force mains. All leaks shall be repaired and lines retested as approved by the City. Prior to testing, the pipelines shall be supported in an approved manner to prevent movement during tests.

END OF SECTION



SECTION 25 – PUMP STATION CONTROLS

25.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for a complete electrical system as hereinafter specified and shown on the Contract Drawings.

25.02 SERVICE AND METERING

- A. Permanent electrical service and metering will be provided at each Pump Station. Coordinate all work required with Duke Energy.

25.03 CODES

- A. All material and installation shall be in accordance with the latest edition of the National Electrical Code (N.E.C.), and NFPA 70 code articles that are applicable to the minimum electrical installation requirements for sewer lift stations.

25.04 GENERAL

- A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or Manufacturer's specifications shall be submitted for review and acceptance as required by the Engineer.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed and conform with applicable standards of NEMA and ANSI.
- C. Electrical equipment shall, at all times during construction, be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the CONTRACTOR at his expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such special tests as directed by the Engineer, at the cost and expense of the CONTRACTOR, or shall be replaced by the CONTRACTOR at his own expense.

25.05 MISCELLANEOUS EQUIPMENT

- A. Boxes and Fittings:
 - 1. NEMA 4X boxes shall be used outdoors or in "wet" locations. Construction shall be 316 stainless steel.



2. Conduit hubs shall be used for all outdoor conduit terminations and shall be as manufactured by Meyers Electric Products, Inc., Raco Div., Appleton Electric Co., or approved equal.
3. Conduit sealing bushings shall be Coruse Hinds type EYS or approved equal.
4. All panels shall be protected from internal corrosion by the use of corrosion – inhibiting vapor capsules, Northern Instruments Model Zerust VC, Hoffman Model A-HCI, or equal.

25.06 PUMP CONTROL SYSTEM

A. PANEL CONSTRUCTION:

1. The electrical control equipment shall be mounted within a NEMA Type 4X, dead front enclosure, constructed of not less than #14 gauge stainless steel (316 gauge). The enclosure shall be equipped with an inner aluminum door and shall incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. Outer panel door shall be equipped with door stop. Panel shall have lockable, 3-point latching system.

B. PUMP CONTROL CABINET COMPONENTS

1. Enclosure: Enclosure shall be NEMA 4X by Hoffman or approved equivalent with a heavy-duty padlock hasp. Enclosure shall be 316 Stainless Steel.
2. Inner Safety Door: Panel shall include one aluminum inner safety door, 12 gauge nominal thickness (minimum) with 3/4-inch, 90 degree break bend on all edges for rigidity; full length aluminum hinge; positive twist lock handle; safety latch to keep door open during maintenance.
3. Provide and install 120V LED cabinet light, Hoffman LEDA1S35. Provide custom mounting brackets as required. Provide Hoffman connector kit LEDA20C and tie to limit switch installed in panel.

C. PUMP STATION CONTROL/MONITORING EQUIPMENT



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1. The Lift Stations shall be monitored and controlled via a SCADA Control Cabinet. This cabinet shall be provided, installed and programmed by others. The CONTRACTOR shall be responsible for providing the conduit and conductors required for 120V AC circuits, 24V DC circuits and 4-20mA signals as indicated on the Contract Drawings. The CONTRACTOR shall coordinate all work, terminations and other details with the SCADA Control Cabinet provider.

D SURGE PROTECTION DEVICE

1. A Surge Protection Device (SPD) meeting the requirements of ANSI Standard C-62.41 (latest revision) shall be provided.
2. The Surge Protection Device (SPD) shall be 120/240V, 3 ϕ , 4-wire. ASCO model # 430240HP10ACSJ10.

F. CONTROL RELAYS

1. Control Relays: All relays shall meet the following:
 - a. Compact, general-purpose, plug-in type.
 - b. Socket mounted.
 - c. Contacts rated for not less than 10 amperes at 120V.
 - d. Square-D Class 8501, Type R, miniature plug-in with relay base. Poles and coil voltages vary, refer to contract drawings.

F. PHASE MONITOR RELAY

1. An integral 240 VAC three-phase monitor shall be provided in the pump control cabinet. The phase monitor shall detect loss of phase, phase reversal, low phase and high phase faults. All phase monitor adjustments shall be adjustable. Phase monitor relay shall be Diversified Electronics cat# SLA-230-ALE.

G. CIRCUIT BREAKERS

1. Main and Motor Circuit Breakers: The panel shall include main and motor circuit breakers sized as shown. The breakers shall be mounted on the subpanel with handle through the inner door. The main and motor circuit breakers shall be products of Square-D, HGL or HJL as indicated.

H. MOTOR STARTERS

1. Pump starters shall consist of across-the-line motor starters or Variable Frequency Drives (VFD's).



2. Across-the-line motor starters shall be provided with remotely resettable and adjustable electronic overload relays.
3. Variable Frequency Drives shall be Yaskawa IQPump1000 series or approved equal.

I. ELECTRICAL WIRING

1. Panel (or site) lighting, receptacles, heaters, controls, telemetry and fans on separate branch circuits.
2. Branch circuit breakers shall be Square-D FAL12015 and FAL12020 as applicable.
 - i. Power wiring shall be 600 volt, type THWN stranded copper, No. 12 AWG size, for 120V service.
 - ii. Discrete 24V DC signal wiring shall be 600-volt type THWN stranded copper, sized for the current carried, but not smaller than No. 14 AWG.
 - iii. Analog signal wiring shall be stranded copper in twisted shield pairs, no smaller than No. 16 AWG, Belden 8719.
 - iv. Panel wiring shall be routed within 1" x 1" panduits.
 - v. Hinge wiring shall be secured at each end with the bend portion protected by a plastic sleeve.
 - vi. Analog or DC wiring shall be separated from any AC power or control wiring by at least six inches.
 - vii. Each wire shall be uniquely identified using plastic, snap-on numbered tags.
 - viii. Terminal blocks shall be provided for all field wiring entering the panel. The greater of 8 or 15% spare terminal blocks shall be provided. Terminal blocks shall be Allen-Bradley 1492-W10.
 - viii. No more than one wire per screw and yoke termination.

J. PANEL MOUNTED DEVICES

1. 3-Position Selector Switches. Units shall meet the following:
 - a. Heavy-duty, oil-tight, industrial type push buttons rated for NEMA 4X service.



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- b. Contacts rated for 120-volt ac service at 10 amperes continuous.
 - c. Number of positions and contact arrangements as required.
 - d. Factory-engraved legend plate indicating function.
 - e. Panel mounting accommodating panel thickness between 1/16 to ¼ inch.
 - f. Operator: black flush head.
 - g. 3-position, maintained, pump hand/off/auto switch. Square-D Class 9001, KS43FB with contacts as required.
- 2. Duplex receptacles shall be Ground Fault Interrupting (GFI) type, Hubbell model number GFR53521A or equal.
 - 3. Elapsed time meter. Cramer 635G.
 - 4. MINI CAS II Unit:
 - a. MINI CAS II supervisory relay to be provided by pump manufacturer.
 - 5. Alarm System :
 - a. The pump control cabinet shall include a vapor-proof red light mounted on the exterior of the cabinet as shown on the Contract Drawings for alarm visual indication.
 - 6. Ventilation system:
 - a. Fans, exhaust grills, filter, etc. shall be as specified on the Contract Drawings.

K. SPARES AND EXPENDABLES

- 1. Provide the following spare parts:
 - a. Five (5) spare relays of each type provided.
 - b. Provide the following expendables:
 - i. Two-year supply of corrosion inhibitor capsules
 - ii. Six (6) spare fuses.

L. Operating Controls and Instruments:



1. All operating controls and instruments shall be securely mounted on the control compartment door. All controls and instruments shall be clearly labeled to indicate function.

M. Miscellaneous Equipment:

1. All panels shall be protected from internal corrosion by the use of corrosion – inhibiting vapor capsules, Northern Instruments Model Zerust VC, Hoffman Model A-HCI, or equal.

N. Installation:

1. Unless otherwise noted on the Contract Drawings, top of cabinets shall be mounted six feet above grade, properly aligned and adequately supported independently of the connecting raceways.
2. All wiring in the control panel shall be neatly formed, grouped, and identified to provide a neat and orderly appearance.
3. All nameplates shall be properly secured.

25.07 RADAR LEVEL TRANSDUCER

- A. The level sensor for monitoring the sewage level in the wet well shall consist of a pulsed radar level sensor. The cable shall be connected directly to the signal input terminals in the SCADA Control Cabinet with no intervening junction box or calibration device required. The device shall require a 10-30 VDC low voltage power supply. The output shall be a standard 4-20 MADC control signal, factory set proportional to the selected fixed range of the transducer.
- B. The radar level sensor shall be E+H FMR10 with Flooding Protection Tube accessory.

25.08 FLOAT SWITCHES

- A. Levels shall be sensed by polypropylene weighted floats. The floats shall be heavy-duty type, with hermitically sealed non-mercury switch inside each float. Weights shall be 20 ounces minimum. The floats shall be secured at the top of the wetwell via a stainless steel wall mount bracket designed specifically for float installation.

25.09 CONDUIT INSTALLATION



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- A. Where conduits enter or leave all outlet boxes, cabinets safety switches, tap boxes, motor controllers, etc., threaded hubs shall be used. Bushings 1-inch and larger shall be of an approved insulated type. Unless otherwise indicated, conduit 2-inches shall be supported at intervals not exceeding ten (10) feet.
- B. During construction, all installed raceways shall be temporarily plugged or otherwise protected from the entrance of moisture, dirt, trash, plaster, moisture, etc., through neglect of the CONTRACTOR to so protect them, shall be replaced by the CONTRACTOR without additional expense to the Owner. No kinked, clogged or deformed raceways will be permitted on the job. Raceways shall be cut to proper length so that ends will fit accurately in the outlets. Where raceways cross building expansion joints, a suitable raceway expansion fitting shall be used.
- C. Size of raceway shall not be less than NEC requirements, but in no case shall be less than indicated on the Contract Drawings. Combining of circuits, other than detailed, will not be permitted. The CONTRACTOR shall install larger size raceways than detailed where there is excessive length of unbroken run or excessive number of bends.
- D. Bends in metallic raceways shall be made while "cold" and in no case shall the raceways be heated. Raceways shall not be bent through more than 90°. The radius of bends shall not be less than six (6) times the internal diameter of the raceway. Not more than four (4) (equivalent 90°) bends will be permitted between outlets, the bends at the outlets being counted.
- E. Raceways shall be properly aligned, grouped and supported. Exposed raceways shall be installed at the right angles to or parallel to the principal structural members. Concealed raceways, unless otherwise indicated, may take the most direct route between outlets. Raceways shall be firmly held in place. Raceways shall run to avoid trapping wherever possible. Where areas are indicated for future openings, foundations, etc., all raceways shall be run around such areas. The CONTRACTOR shall provide necessary inserts in poured concrete areas and shall furnish and install all necessary sleeves through walls, floors and roofs for passage of raceways. Sleeves through roofs and/or exterior walls shall be properly sealed by the CONTRACTOR against entrance of moisture, etc., into the building. Where necessary repairs to the building structure using material in no way inferior to that originally installed and using labor skilled in the trades involved.

25.10 CONDUCTORS

- A. Splices, taps and attachments of fittings and lugs shall be electrically and mechanically secure. Approved solderless lugs and connectors shall be used for all conductors with 2-bolt type being used for sized No. 4/0 and larger. There shall be plenty of slack cable in boxes, outlets and cabinets to ensure that there is no binding at the bushings. All lugs shall be of the correct sizes for the conductor in order to fit the conductor into a lug.
- B. Splices or joints to other than lugs or terminals shall not be allowed.



25.11 GROUNDING

- A. The entire electrical system shall be completely and effectively grounded as required by the NEC and as specified hereinafter.
- B. All metallic raceways shall be mechanically and electrically secure at all joints and at all boxes, cabinets, fittings and equipment. Metallic raceways entering the motor control center control panels or other electrical boxes shall be grounded to the appropriate ground bus. All metallic raceways shall be electrically continuous throughout the entire conduit system. Bond wires shall be used in exterior concrete pull boxes.

25.12 SUPPORTS

- A. The CONTRACTOR shall furnish and install all necessary supports for properly mounting all electrical equipment and raceways. Such supports shall be fabricated and installed in a neat and workmanlike manner, and care shall be taken that at no time shall any portion of the building structure be overloaded. Should the building structure sustain damage through carelessness or through failure of the CONTRACTOR to properly support and install the electrical equipment, the CONTRACTOR shall bear all costs involved in repairing or replacing such installation.
- B. All supports exposed to the weather shall be stainless steel. Provide plastic caps on all unistrut ends.

25.13 TESTS AND CHECKS

- A. The following minimum tests and checks shall be made prior to the termination of any field wiring.
 - 1. Megger terminals and buses after disconnecting devices sensitive to megger voltage.
 - 2. A 1,000V DC megger shall be used for these tests.
 - 3. The first test shall be made with main circuit breaker closed and all remaining breakers open. A second test shall be made with all circuit breakers closed.
 - 4. The test results shall be recorded and forwarded to the Engineer for his review. Minimum megger readings shall be 500 megohms in both tests.
- B. The following shall be done before energizing any equipment or control panel.
 - 1. Remove all current transformer shunts after completing the secondary circuit.
 - 3. Vacuum clean all interior equipment.

25.14 SPARE PARTS



- A. Spare parts shall be furnished to permit convenient and quick service restoration upon failure of a particular unit.
- B. The spare parts shall be packed in a manner suitable for long-term storage and shall be adequately protected against corrosion, humidity, and temperature.

25.15 WARRANTY

- A. Warranty - The SYSTEM SUPPLIER shall warrant all hardware and software provided under this contract against all defects in material and workmanship for a period of one year. The system supplier shall warrant the telemetry software to be free of defects for as long as it is operational in the city. The SYSTEM SUPPLIER shall also provide free updates to this software for the life of the system. The function modules utilized in the remote terminal units shall carry an additional two-year return-to-factory warranty. The two-year return-to-factory warranty shall also cover damage due to lightning.

END OF SECTION



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SECTION 26 – ELECTRICAL

GENERAL

26.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for complete electrical system as hereinafter specified and shown on the Contract Drawings.
- B. The work, apparatus and materials, which shall be furnished under these Specifications and accompanying Drawings, shall include all items listed hereinafter and/or shown on the Drawings. Certain equipment, which will require wiring thereto and/or complete installation, is indicated. All materials necessary for the complete installation shall be furnished and installed by the CONTRACTOR to provide complete power, lighting, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein.
- C. The CONTRACTOR shall furnish and install the necessary cables, protective devices, conductors, supports, raceways, exterior electrical system, etc., to serve lighting loads and miscellaneous electrical loads as indicated on the Drawings and/or as specified. The CONTRACTOR shall install any control panel provided under this or any other sections on the specifications.
- D. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; sub-standard work will be rejected.
- E. For process instrumentation furnish and install all conduit, wire and interconnections between primary elements, transmitters, local indicators and receivers.
- F. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work, which may be reasonably implied as being incidental to the work of this Section, shall be furnished at no extra cost.

26.02 SERVICE AND METERING

- A. Permanent electrical service and metering will be provided at each Pump Station. Coordinate all work required with Duke Energy.

26.03 CODES, INSPECTION AND FEES

- A. All material and installation shall be in accordance with the 2014 edition of the National Electrical Code (N.E.C.), and NFPA 70 code articles that are applicable to the minimum electrical installation requirements for sewer lift stations.
- B. Pay all fees required for permits and inspections.



26.04 TESTS

- A. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct OWNER's personnel in the proper operation of the systems.
- B. The following minimum tests and checks shall be made prior to the energizing of electrical equipment. Test shall be by the CONTRACTOR and a certified test report shall be submitted providing all test results and stating that the equipment meets and operates in accordance with the Manufacturer's and job specifications, and that equipment and installation conforms to all applicable Standards and Specifications:
 - 1. Test all 600-volt wire insulation with a megohm meter after installation. Make tests at not less than 1000 volts. Submit a written test report of the results to the engineer.
 - 2. Mechanical inspection of all circuit breakers to assure proper operation.
- C. The Engineer shall be notified forty-eight (48) hours before tests are made to enable the Owner to have designated personnel present.

26.05 CUTTING AND PATCHING

- A. All cutting and patching shall be done in a thoroughly workmanlike manner.

26.06 INTERPRETATION OF DRAWINGS

- A. The Drawings are not intended to show exact locations of conduit runs.
- B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.
- C. Unless otherwise approved by the Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
- D. Where circuits are shown as "home-runs," all necessary fittings and boxes shall be provided for a complete raceway installation.
- E. The CONTRACTOR shall harmonize the work of the different trades so that interferences between conduits, piping, equipment, architectural and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets, fittings, etc., required to accomplish this shall be furnished and installed by the CONTRACTOR without additional expense to the Owner. In case interference develops, the Owner's authorized representative is to decide which equipment, piping, etc., must be relocated, regardless of which was installed first.
- F. The locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during



construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

- G. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.
- H. The ratings of motors and other electrically operated devices together with the size shown for their branch circuit conductors and conduits are approximate only and are indicative of the probable power requirements insofar as they can be determined in advance of the purchase of equipment.
- I. All connections to equipment shall be made as shown, specified and directed and in accordance with the approved shop drawings, regardless of the number of conductors shown on the Electrical Drawings.

26.07 RECORD DRAWINGS

- A. As the work progresses, legibly record all field changes on a set of project Contract Drawings. When the project is complete, furnish a complete set of reproducible "As-built" drawings for the Project Record Documents.

26.08 COMPONENT INTERCONNECTIONS

- A. Component equipment furnished under this Specification will not be furnished as integrated systems.
- B. Analyze all systems components and their shop drawings; identify all terminals and prepare drawings or wiring tables necessary for component interconnection.

26.09 SHOP DRAWINGS

- A. As specified under other Sections, shop drawings shall be submitted for review and acceptance for all materials, equipment, apparatus, and other items as required by the Engineer.
- B. Shop drawings shall be submitted for the following equipment:
 - 1. Pump Control Cabinet
 - 2. Disconnects
 - 3. Circuit Breakers
 - 4. Variable Frequency Drives
 - 5. Surge Protection Device
 - 6. Junction Boxes



7. Wire & cable
 8. Conduit
- C. The Manufacturer's name and product designation and catalog cutsheets shall be submitted for the following material:
1. Conduit
 2. Boxes and fittings
- D. Prior to submittal by the CONTRACTOR, all shop drawings shall be checked for accuracy and contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.
- E. The Engineer's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship required by the Specifications and Drawings, which may not be indicated on the shop drawings, is included under the work of this Section.
- F. The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.
- G. No material shall be ordered or shop work started until the Engineer's review and acceptance of shop drawings has been given.

26.10 ELECTRICAL IDENTIFICATION

SUMMARY

- A. Section Includes:
1. Nameplates.
 2. Labels.
 3. Wire markers.
 4. Conduit markers.
 5. Stencils.
 6. Underground Warning Tape.
 7. Lockout Devices.



NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved white letters on black background color.
- B. Letter Size:
 - 1. 1/8 inch high letters for identifying individual equipment and loads.
 - 2. 1/4 inch high letters for identifying grouped equipment and loads.
- C. Minimum nameplate thickness: 1/8 inch.

LABELS

- D. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

WIRE MARKERS

- E. Description: Cloth tape, split sleeve, or tubing type wire markers.
- F. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number.
 - 2. Control Circuits: Control wire number as indicated on shop drawings.

CONDUIT AND RACEWAY MARKERS

- G. Description: Stencils.
- H. Color:
 - 1. Medium Voltage System: Black lettering on white background.
- I. Legend:
 - 1. Medium Voltage System: HIGH VOLTAGE.

STENCILS

- J. Stencils: With clean cut symbols and letters of following size:
 - 1. Up to 2 inches Outside Diameter of Raceway: 1/2 inch high letters.
 - 2. 2-1/2 to 6 inches Outside Diameter of Raceway: 1 inch high letters.
- K. Stencil Paint: As specified in other sections of specifications, semi-gloss enamel, colors.



UNDERGROUND WARNING TAPE

- L. Description: 6 inch wide plastic tape, colored red with suitable warning legend describing buried electrical lines.

LOCKOUT DEVICES

- M. Lockout Hasps:

1. Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.

PREPARATION

- N. Degrease and clean surfaces to receive adhesive for identification materials.
- O. Prepare surfaces in accordance with Division 9 for stencil painting.

INSTALLATION

- P. Install identifying devices after completion of painting.

- Q. Nameplate Installation:

1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
4. Secure nameplate to equipment front using screws or adhesive.
5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
6. Install nameplates for the following:
 - a. Pump Control Panel.
 - b. SCADA Control Cabinet.
 - c. Disconnect Switches.

Label Installation:



1. Install label parallel to equipment lines.
2. Install label for identification of individual control device stations, and wall switches where their purpose is not readily obvious.
3. Install labels for permanent adhesion and seal with clear lacquer.

Wire Marker Installation:

1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
2. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
3. Install labels at data outlets identifying patch panel and port designation.

Raceway Marker Installation:

1. Install raceway marker for each raceway longer than 6 feet.
2. Raceway Marker Spacing: 20 feet on center.
3. Raceway Painting: Identify conduit using field painting in accordance with Division 9.

Stencil Installation:

1. Apply stencil painting in accordance with Division 9.

Underground Warning Tape Installation:

1. Install underground warning tape along length of each underground conduit, raceway, or cable 12 inches below finished grade, directly above buried conduit, raceway, or cable.

26.11 RACEWAYS AND FITTINGS



GENERAL

SCOPE OF WORK

- A. All aboveground, exterior conduit shall be rigid aluminum. All conduit installed in slabs or below grade shall be rigid non-metallic heavy wall conduit. Minimum conduit size in floor slabs, walls, or below grade shall be $\frac{3}{4}$ -inch.

PRODUCTS

MATERIALS

- A. Rigid Non-metallic Conduit and Fittings : Rigid non-metallic conduit and fittings of heavy wall polyvinyl chloride (PVC) meeting ASTM Specification D 1785, approved by UL for the specific purpose, may be used in locations not prohibited by the NEC Section 347-3. When equipment grounding is required by Article 250 of the NEC, a separate grounding conductor shall be installed in the conduit. Installation methods of rigid non-metallic conduit shall conform to Section 347-5 through 347-15 of the NEC. Supports shall be in accordance with Table 347-8.
- B. Rigid Aluminum Conduit and Fittings : All electric aluminum conduit and fittings shall conform ANSI C80.5. Rigid aluminum conduit shall not be used for concealed work. The use of dissimilar metals shall be avoided throughout the system. Installation methods of metallic conduit shall be in accordance with Sections 348-4 through 348-13 of the NEC.
- C. Flexible Non-Metallic Conduit: As indicated or necessary, equipment shall be connected with liquid-tight flexible non-metallic conduit of the size required for the conductors to the equipment. Liquid-tight flexible non-metallic conduit shall be UL, type UA. It shall be installed in such a manner that liquids tend to run off the surface and not drain toward the fittings. Sufficient slack shall be provided to reduce the effects of vibration. Where the fittings are brought into an enclosure with a knock-out, a gasket assembly consisting of an O-ring and retainer shall be installed. These fittings shall be nylon insulated-throat type. Conduit shall be galvanized, PVC covered and shall be constructed to provide a continuous metallic bond. It shall be equal to that manufactured by Appleton "Sealtite".

EXECUTION

INSTALLATION:

- A. Conduit shall be concealed unless otherwise shown. Exposed conduit shall run parallel or perpendicular to building planes. Concealed conduits shall be run in a direct line with long sweep bends and offsets. Conduit shall be continuous and installed in such a manner that the system shall be electrically continuous throughout. Conduit ends shall be capped during construction. The ends of all conduits shall be carefully reamed free from burrs after threading and before installation. All cuts shall be made square. All joints shall be made up tight. Care shall be taken to see that all light and power conduit runs form a permanent and continuous ground connection point.



- B. The Contractor shall permanently and effectively ground service neutral and all raceways, devices, and utilized equipment in accordance with the requirements of the NEC, and as shown or required. All grounding electrodes shall have rigid clamp jaws and be UL listed for the application. A separate ground wire shall be provided in all lighting and power raceways.
- C. Conduit stubs shall be located to conform to location of connection boxes on motors and/or other equipment served. Traps in conduit runs shall be avoided. Device boxes in concrete shall be set true and packed as necessary to exclude concrete during placement.
- D. Final connections from the end of the conduit run to equipment or controls for both interior and exterior work shall be made by means of liquid-tight flexible conduit. The length of these sections of flexible conduit shall not exceed 36 inches in length.
- E. Conductors shall be installed in a workmanlike manner. Damage to insulation or a reduction of the wire size when pulled into the conduit shall be avoided.
- F. All areas of the project are considered to be wet locations and construction within these areas shall be moisture and weather resistant. Work below grade, on grade, or beneath slabs shall be waterproof.
- G. Electrical work shall not rest upon, be supported by or hung from ductwork, piping or equipment. Adequate supports shall be provided to assure that this is achieved.
- H. Boxes, conduit, hangers, panels, etc., shall be fastened to steel by machine bolts and nuts, and by expansion bolts in concrete. Wood or composition plugs shall not be used.
- I. Buried conduit shall be installed so as to assure a watertight system. Turns and bends shall be made using watertight fittings or field-made bends. Trenchwork for installation of conduits and equipment underground shall conform to applicable sections of these specifications. Locations for buried conduit shall be carefully plotted to avoid conflict with other installations. Unless otherwise noted, all buried electrical installations shall be installed at least 24-inches below finished grade.
- J. Where installations pass through walls, slabs, or other structures, all cutting shall be accomplished without damage to the structure. Boring and cutting shall be done with proper equipment and without delivering excessive vibration or shock to the structure.

26.12 WIRES AND CABLES

GENERAL

SCOPE



- A. This section includes the furnishing, installation, and connection of all low voltage and power wiring. This shall include all wires and cables utilized for controls. Conductors specified for low voltage controls shall be coordinated with and approved by equipment manufacturers.
- B. Control wiring specified herein shall be installed and connected by the Electrical Contractor to perform the functions specified in other sections of these specifications.

C. REFERENCE STANDARDS:

The following specifications and standards, except as hereinafter modified, are incorporated herein by reference and form a part of this specification to the extent indicated by the references thereto. Except where a specific date is given, the issue in effect (including amendments, addenda, revisions, supplements, and errata) on the date of Invitation for Bids shall be applicable. In text such specifications and standards are referred to by basic designation only.

- 1. Federal Specifications (Fed. Spec.)
J-C-30A(1) - Cable and Wire Electrical (Power, Fixed Installation)
HH-I-595C - Insulation Tape, Electrical, Pressure Sensitive Adhesive, Plastic
- 2. National Fire Protection Association (NFPA) Publications:
No. 70 - National Electrical Code (NEC) WIRES AND CABLES
- 3. Underwriter's Laboratories, Inc (UL) Publications:
No. 83 - Thermoplastic – Insulated Wires
No. 493 - Thermoplastic – Insulated Underground Feeder and Branch Circuit Cables
No. 486 - Wire Connectors and Soldering Lugs

PRODUCTS

MATERIALS

- A. Conductors for 4-20mA signals and where twisted, shielded conductors are shown on the Contract Drawings shall have :
 - 1. 2 conductor, #16 tinned copper conductors.
 - 2. Polyethylene insulation material.
 - 3. Aluminum foil-polyester tape with shorting fold
 - 4. Shall be Belden Part Number 8719 or equal as determined by the engineer.
- B. Conductors for MiniCAS II sensor signals and where twisted, shielded conductors are shown on the Contract Drawings shall have :



1. 2 conductor, #16 tinned copper conductors.
 2. Polyethylene insulation material.
 3. Aluminum foil-polyester tape with shorting fold
 4. Shall be Belden Part Number 8719 or equal as determined by the engineer.
- C. Power Conductors shall consist of annealed copper wire having a minimum of 98% conductivity and shall be sized and insulated or isolated in accordance with the NEC for the current and voltage of the individual circuit. All conductors, unless specifically noted, shall have type "THWN", 75 degrees f, 600 Volt insulation.
- D. Joints shall be made with mechanical connectors and insulated with two layers of Scotch No. 33 or Slipnot No. 3201 tape.
- E. All splices for conductors #12 through #6 AWG solid or stranded shall be made with "Scotchlock" spring connectors or the pressure wire type. For wire sizes larger than #6, splices shall be made with "OZ" type "XW" or "XTP" as appropriate to the splice being installed. Equal fittings of Burndy and Penn Union may be used. Tape shall be equal to Scotch No. 33 or Slipnot NO. 3201 over splice and filler tape on splices shall be equal to "Scotchfill".
- F. Flexible cords and cables shall be of the size and number of conductors as indicated on Contract Drawings. Cords shall comply with the requirements of Article 400 of the NEC.
- G. Contractor shall coordinate the requirements for flow meter signal converter cable with the respective equipment manufacturers.

EXECUTION

INSTALLATION

- A. All conductors shall be coded throughout, using different colors for phases, white for neutral (white with other color stripe for neutral of a different voltage system) and green for ground. The same color code for a particular phase or part of a circuit shall be run with the same conductor throughout the job. Colors used for each voltage system shall be different. Conductors No. 8 AWG and larger may be black in color but shall be identified with colored tape in all outlet, junction or pull boxes and at the terminals of the equipment.

<u>Phase</u>	<u>120/240V, 3PH, System</u>
A	Black
B	Orange
C	Blue



Neutral
Ground

White
Green

- B. All wires in cabinets, boxes, panels, pull and junction boxes shall be trained neatly and tied.
- C. All wires and cables, larger than No. 12 AWG, shall be continuous from origin to destination without splices unless written permission is given by the ENGINEER.
- D. Conductors shall be sized in accordance with NEC requirements. No conductor shall be smaller than No. 12 AWG, except control and signal circuit conductors which may be No. 14 AWG, unless otherwise specified on the Contract Drawings.

TERMINATIONS AND SPLICES

- A. Power Conductors: Terminations shall be die type or set screw type pressure connectors as specified. Splices (where allowed) shall be die type compression connector and waterproof with heat shrink boot or epoxy filling.
- B. Control Conductors: Termination on saddle-type terminals shall be wired directly with a maximum of two conductors per termination. Termination on screw type terminals shall be made with a maximum of two spade connectors. Splices (where allowed) shall be made with insulated compression type connectors. Heat shrink boots shall be utilized for all outdoor splices.
- C. Instrumentation Signal Conductors: Terminations permitted shall be typical of control conductors. Splices are allowed at instrumentation terminal boxes only.
- D. Except where otherwise approved by the Engineer no splices will be allowed in manholes, handholes or other below grade located boxes.
- E. Splices shall not be made in control devices (i.e., pressure switches, flow switches, etc.), conduit bodies, etc.

26.13 MAIN DISCONNECT

GENERAL

SYSTEM DESCRIPTION

- A. All disconnecting means shall meet the requirements of the NEC.

PRODUCTS

ACCESSORIES



- A. Main Disconnect: Fused switch shall be heavy-duty type “HD”. The blades of switches shall be quick-make, quick-break operating type. All lugs the switch shall be equal to Burdy’s solderless quick lugs or shall be compression type. Switch shall be 3-pole and shall have fuse sizes as indicated on the Contract Drawings. Enclosure shall be NEMA 4X stainless steel. The switch shall conform to NEMA Standards and shall be UL listed. Switches shall be equal to General Electric, Square-D, or Cutler-Hammer.
- B. Main disconnect shall have a solid neutral, ground lug and shall be listed for use as service entrance equipment.

EXECUTION

INSTALLATION

- A. Install disconnect as recommended by the manufacturer, required by Code, and as shown on the Contract Drawings.

26.14 SUPPORTING DEVICES

GENERAL

WORK INCLUDED

- A. Conduit supports.
- B. Channel supports for equipment.

REFERENCE STANDARDS

- A. National Electrical Code

PRODUCTS

CONDUIT SUPPORTS

- A. Single Runs: Galvanized conduit straps or ring bolt type hangers with specialty spring clips. Plumbers perforated straps or wire will not be acceptable.
- B. Multiple Runs: Conduit rack with 25 percent spare capacity.
- C. Vertical Runs: Channel support with conduit fittings.

CHANNEL SUPPORTS

- A. Stainless steel channel sections shall be rolled from AISI 1008 commercial grade steel and be in conformance with ASTM A 240.



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- B. The cross sectional width dimension of the channel shall be a minimum of 1-5/8-inch. The depth will be as required to satisfy the load requirements. Channel with 1-5/8-inch depth or greater shall be rolled from manufacturer's standard 12 gauge steel. Channel smaller than 1½-inch may be manufacturer's standard 14 gauge steel.
- C. Attachment holes, when required, shall be factory punched on hole centers equal to the channel cross sectional width dimension and shall be a maximum of 9/16-inch in diameter.
- D. Channel attachment nuts shall be designed to prelocate in the channel and provide a bearing surface on the turned down lips while making positive contact with the side walls of the channel.
- E. Straps for the support of conduit shall be designed such that the attachment nut is captivated on the shoulder of the strap when tightened, and the attachment bolt shall allow tightening by either a screwdriver or wrench.
- F. All nuts, bolts, straps, threaded rod and miscellaneous hardware shall be stainless steel.
- G. When tested in accordance with ASTM B117-73 procedure, there shall be no sign of red rust after 1,000 hours of testing. Certified test results to support this must be submitted upon request.

ANCHOR METHODS

- A. Hollow Masonary: Toggle bolts, spider type expansion anchors, or tapcons.
- B. Solid Masonary: Lead expansion anchors, preset inserts, or tapcons.
- C. Metal Surfaces: machine screws, bolts, welded studs, or beam type clamps on steel joints.
- D. Wood Surfaces: Wood Screws
- E. Concrete Surfaces: Self-drilling anchors, power-driven studs, expansion bolts, or tapcons.
- F. See Contract Drawings for special mounting and installation.

EXECUTION

INSTALLATION

- A. Layout to maintain headroom, neat mechanical appearance, and to support equipment loads required.



- B. Verify exact mounting and installation requirements with the Owner's representative prior to installation.

26.15 GROUNDING

GENERAL

SCOPE OF WORK

- A. Furnish and install a complete grounding system in strict accordance with Article 250 of the National Electrical Code and as hereinafter specified and shown on the Contract Drawings.

PRODUCTS

MATERIALS

- A. Ground rods: Ground rods shall be Copperclad steel 3/4-inch x 20 foot. Ground rods shall be Copperweld or be an approved equal product.

EXECUTION

GENERAL

- A. Grounding electrodes shall be driven as required. Where rock is encountered, grounding plates may be used in lieu of grounding rods.
- B. All equipment enclosures, motor and transformer frames, conduits systems, cable armor, exposed structural steel and similar items shall be grounded.
- C. Exposed connections shall be made by means of approved grounding clamps. Exposed connections between different metals shall be sealed with No-Oxide Paint Grade A or approved equal. All buried connections shall be made by welding process equal to Cadweld.
- D. All underground conductors shall be laid slack and where exposed to mechanical injury shall be protected by pipes or other substantial guards. If guards are iron pipe or other magnetic material, conductors shall be electrically connected to both ends of the guard.
- E. The Contractor shall exercise care to insure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.
- F. Provide grounding test wells where indicated on the Contract Drawings.

TESTS

- A. The Contractor shall test the ground resistance of the system. All test equipment shall be



provided by the Contractor and approved by the Engineer. Dry season resistance of the system shall not exceed 2 ohms. If such resistance cannot be obtained with the system as shown, the Contractor shall provide additional grounding as directed by the Engineer, without additional payment. The Contractor shall submit all grounding system test results to the Engineer for review.

26.16 VARIABLE FREQUENCY DRIVES

SUMMARY

- A. Section Includes: Requirements for providing, installing and testing the 240-volt variable frequency drives. Provide drives in individual free standing enclosures, as shown. Furnish harmonic studies as specified.

REFERENCES

- A. Codes and standards referred to in this Section are:
1. NEMA ICS 1 - General Standards for Industrial Control and Systems
 2. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Not More than 2000 Volts AC or 750 Volts DC.
 3. NEMA ICS 3 - Industrial Control and Systems Factory Built Assemblies
 4. NEMA ICS 7 - Industrial Control and Systems: Adjustable Speed Drives
 5. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable Speed Drive Systems
 6. NEMA 250 - Enclosures for Electrical Equipment
 7. NFPA 70 - National Electrical Code
 8. IEEE 85 - Test Procedure for Airborne Sound Measurements on Rotating Electric Machinery
 9. IEEE 519 - IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
 10. UL 845 - Motor Control Centers

SYSTEM DESCRIPTION

- A. Design Requirements:



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1. Provide variable frequency drives to vary the speed of NEMA standard, 3-phase, 240-volt, induction motors and driven equipment by varying the frequency and voltage applied to the motors.
 2. Provide variable frequency drives that fit in the space shown. Units exceeding the dimensions shown will not be acceptable.
 3. Provide variable frequency drives that automatically restart when power is restored after a power outage. Provide control logic so the drive is allowed to restart when power is restored.
- B. Rated Output Power: Provide adjustable frequency drives with an output that is at least 3 percent greater than the driven motor's full nameplate rating.
- C. Torque Output: Provide variable torque or constant torque output drives as required by driven equipment.
- D. 6-Pulse Drive Technology: Provide adjustable frequency drives serving motors 75 HP or smaller utilizing 6-pulse drive technology.
- E. Performance Requirements: Provide adjustable frequency drives to meet the following requirements of IEEE 519:
1. Total harmonic distortion THD (Voltage): Maximum of five percent for general distribution systems as measured at the point of common coupling.
 2. Total current harmonic distortion: Not to exceed the values in Table 10.3, Current Distortion Limits for General Distribution Systems (120 V through 69000 V) of IEEE-519 at the point of common coupling.
 3. Capacitor traps for controlling harmonics that require tuning to the power system are not acceptable.
 4. Operate at a minimum efficiency of 95 percent at rated load.
 5. Operate from a 240-volt, 3-phase, 60-hertz supply with a voltage variation of plus 10-percent or minus 20-percent and a frequency variation of plus or minus 2-hertz.
 6. Input power factor: Maintain a 95 percent minimum power factor over a 20 to 100 percent speed range.
 7. Operate an induction motor as specified, including a high-efficiency, high-power factor, premium-duty motor, with no detriment to motor life.
 8. ADJUST THE VFD CARRIER FREQUENCY TO STRIKE A COMPROMISE BETWEEN MOTOR NOISE AND INSULATION STRESS.



9. Operate under the following ambient conditions:

- a. Ambient Temperature: 0 to 50 degrees C
- b. Humidity: 0 to 95 percent

SUBMITTALS

- A. General: Furnish all submittals, including the following, as specified in the Specific/General Provisions.
- B. Product Data and Information: Furnish catalog data including rating and descriptive literature of all components and systems.
- C. Shop Drawings: Furnish the following shop drawings customized for the project:
 - 1. Bill of materials including manufacturers name and catalog number
 - 2. Outline drawings showing dimensions, arrangement, elevations, identification of components and nameplate schedule for all units
 - 3. Interconnection wiring diagrams
 - 4. Individual schematic control diagrams for each unit
 - 5. One line diagrams
 - 6. Obtain and enter full performance data for all motors shown
 - 7. Certification that the variable frequency drives are compatible with the motors and the equipment loads to be driven
- D. Quality Control: Furnish test reports, certificates of inspection and manufacturer's instructions.
- E. Operations and Maintenance Manuals: Furnish operations and maintenance manuals as specified in the Specific/General Provisions.

QUALITY ASSURANCE

- A. Standards: Provide all variable frequency drives manufactured in accordance with referenced standards.
- B. UL Label: Provide a UL Inc. Label or certification of listing by C.S.A. or other recognized testing organization for each adjustable frequency drive.



- C. Codes: Manufacture and install each adjustable frequency drive in accordance with the NEC and local codes.

DELIVERY, STORAGE, AND HANDLING

- A. General: Deliver, store and handle all products and materials as specified in the Specific/General Provisions.
- B. Shipping and Packing: Rigidly brace and protect against weather, damage, and undue strain, all structures, equipment and materials.
- C. Storage and Protection: Furnish clean storage facilities for all equipment delivered but not installed. Provide conditioned air for storage facilities in accordance with the equipment manufacturer's recommendations.
- D. Spare Parts: Furnish spare parts at the same time as pertaining equipment. Deliver the spare parts to the City after completion of the work.

SPARE PARTS

- A. General: Furnish the following spare parts per each group of similar sized units.
 - 1. All parts recommended by the manufacturer in published literature as spare parts. As a minimum, provide the following:
 - a. Six (6) each of each type of fuse used.
 - b. One (1) of complete variable frequency drive for City of St. Pete Beach replacement inventory.
- B. Packaging: Package spare parts in containers bearing labels and identify all spare parts for reordering. Deliver spare parts in original factory packages.

PRODUCTS

MANUFACTURERS

- A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other manufacturers are not acceptable.
 - 1. Yaskawa

MODEL

- A. Acceptable Model: 2A0040FAA. Other models are not acceptable.



DESIGN

- A. Converter Section: Provide input section that converts 240-volts, 60-hertz, 3-phase input to a fixed dc voltage using diodes, bridged rectifiers or SCR's.
- B. Filter Sections: Provide dc link reactor and filter capacitors as required.
- C. Inverter Section: Provide variable frequency drive inverter section that converts the fixed dc voltage to an adjustable frequency output utilizing a pulse-width modulation inverter. Maintain constant volts per hertz ratio on the output with voltage boost for startup as required.
- D. Digital Control Devices: Provide a digital operator keypad located on the front door of the Pump Control Panel to allow setting of all programmable parameters and the following control functions:
 - 1. Speed control settings
 - 2. Speed meter with hertz and 0-100 percent scales
 - 3. Output ammeter
 - 4. Diagnostics package with fault indication and reset push button
- E. Control Features: Provide a control system for each drive that allows the following functions:
 - 1. Remote, isolated 4-20 ma speed control input
 - 2. Isolated 4-20 ma speed output
 - 3. Alarm outputs
 - 4. ON/OFF status output
 - 5. Additional features and controls as specified with the driven equipment
- F. Internal Control Adjustments: Include the following control adjustments for each drive:
 - 1. Acceleration time, 4 to 60 seconds
 - 2. Deceleration time, 4 to 60 seconds
 - 3. Minimum speed limit
 - 4. Maximum speed limit
 - 5. Inverter current limit
 - 6. Supply undervoltage trip
- G. Protection Features: Provide the following drive protection features:
 - 1. Input line current limiting fuses rated 200,000 rms symmetrical amperes short circuit current.
 - 2. Electronic overcurrent protection for instantaneous overload



3. AC input line undervoltage protection, adjustable from 60-100 percent nominal voltage with time delay adjustment and low speed override.
4. Over frequency protection
5. Phase loss protection
6. DC overvoltage protection
7. Logic supply voltage low level protection
8. Line-to-line and line-to-ground output short circuit protection
9. Line-to-line and line-to-ground surge arresters sized for 480-volt 3-phase grounded wye system
10. Overload capability of 110% of the motor FLA based on the NEC ratings for 60 seconds
11. Control circuit fuses
12. Overtemperature protection
13. Diagnostics module to indicate protection trip conditions

COMPONENTS

- A. Power Solid State Components: Provide power solid state switching components with a one minute current rating greater than 110 percent of rated current for variable torque drives or 150 percent of rated current for constant torque drives.
- B. Printed Circuit Boards: Apply a clear conformal coating of acrylic to all printed circuit boards.

WIRING:

- A. General: Provide internal wiring with stranded switchboard wire having 600-volt rated, flame-resistant, type SIS insulation. Use No. 14 AWG wire for control interconnections. Provide power connections as required for the service.
- B. Wire Marker: Provide wire markers at each end of all wires.
- C. Wiring to Door Mounted Devices: Where wiring connections are made to equipment mounted on hinged doors, provide connections with extra flexible wires suitably cabled together and cleated.



- D. Terminal Blocks: Provide wiring of all control connections to all external connections through individual, positive-latch, pull-apart type control terminal blocks rated 600-volts. Locate terminal blocks for front access.
- E. Terminal for External Connections: Provide sufficient terminals for all devices external to the adjustable frequency drive.

SOURCE QUALITY CONTROL

- A. Shop Test: Shop test each variable frequency drive in accordance with IEEE and NEMA standards, including high potential tests and other standard tests for that particular class of equipment. Notify the City fourteen (14) days prior to start of factory testing so that the City, at his option, may witness the testing.
 - 1. After final assembly, test each variable frequency drive at full load with application of line-to-line and line-to-ground bolted faults and show that the adjustable frequency drive trips electronically without device failure.
 - 2. After all tests have been performed, burn-in each adjustable frequency drive for 40 hours at 100 percent inductive or motor load.
 - 3. After the burn-in cycle is complete, subject each adjustable frequency drive to a 30 minute cycling motor load test before inspection and shipping.
- B. Operational Tests: After the equipment has been completely assembled, perform operational test to determine operating conditions and circuit continuity. Provide pushbuttons and selector switches to simulate all control input contacts and indicating lights to indicate all control outputs. Provide a 4-20ma signal generator to simulate analog signals.

EXECUTION

INSTALLATION

- A. General: Install all equipment in accordance with the manufacturer's recommendations and approved shop drawings.
- B. Protective Adjustments: Set all circuit breakers per the approved short circuit and coordination study.
- C. Operational Adjustments: Set all operational devices for proper system operation.
- D. Cable Connections: Terminate and label all field wiring per approved drawings.



FIELD QUALITY CONTROL

- A. Inspections: Inspect, adjust and check the installation for physical alignment, cable terminations and ventilation.
- B. Tests: Perform the following field tests:
 - 1. Close and open each circuit breaker to test operation
 - 2. When site conditions permit, energize and de-energize each equipment item served by each drive, testing the complete control sequence of each item including acceleration and deceleration over complete operating range.
 - 3. Operate each variable frequency drive with driven equipment at full load and test for hot spots.
 - 4. Test Reports: Furnish detailed test reports of all tests indicating test performed, discrepancies found, and corrective action taken.
- C. Manufacturer's Field Services Representative: Provide the services of a factory-trained service engineer, specifically trained on the variable frequency equipment to assist in installation, start-up, testing, calibration, placing into operation and provide training as specified in the Specific/General Provisions.
 - 1. Provide a service engineer when each drive is placed into operation.
 - 2. Provide a service engineer at the jobsite as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory.
 - 3. Following completion of installation and field testing provide training for 6 employees of the City in the proper operation, troubleshooting and maintenance of the equipment as outlined below. All training will be at the City's facilities at a time agreeable to the City:
 - a. Operational Training: A minimum of two 4-hour sessions combining both classroom and hands-on instruction, excluding travel time.
 - b. Maintenance Training: A minimum of two 4-hour sessions combining both classroom and hands-on instruction, excluding travel time.

26.17 WARRANTY

- A. Provide a warranty for all the electrical equipment in accordance with the requirements of other Sections. Under no circumstances shall the warranty be for less than one year starting from substantial completion.



26.18 TESTS AND INSPECTIONS

GENERAL

SCOPE OF WORK

- A. The CONTRACTOR shall arrange for all inspections required by the local authority having jurisdiction. Approval of the installation by any such local authority shall not relieve the CONTRACTOR of any portion of his responsibility for adequate performance of the completed installation.

SUBMITTALS

- A. The CONTRACTOR shall furnish at least two copies of test records to the ENGINEER. At the completion of all tests specified herein and any others required to make operational all equipment, all records shall be viewed by the CONTRACTOR, then transmitted directly to the ENGINEER. All prints shall be corrected and verified for corrections of in-field changes by the CONTRACTOR prior to submittal.

PREPARATION

- A. After completion and prior to being energized, the electrical installation shall be tested to the extent necessary to demonstrate that all systems are complete and ready for operation. The CONTRACTOR shall notify the ENGINEER and the OWNER for the final inspection prior to energizing the system.
- B. The CONTRACTOR shall furnish all necessary test equipment to satisfactorily perform all tests specified herein or required by applicable codes and standards.

TESTING

- A. The CONTRACTOR shall test all wire, cable, equipment, and systems installed or connected under the Agreement to assure proper installation, settings, connection, and functioning in accordance with the Contract Drawings, Specifications and the manufacturer's recommendations.
- B. When conducting tests the CONTRACTOR shall:
 - 1. Include all tests and inspections recommended by the equipment manufacturer and applicable Codes and Standards.
 - 2. Include any additional tests required by the ENGINEER that he deems necessary because of field conditions to determine that equipment, material, and systems meet the requirements of the Specifications.



3. Maintain in quadruplicate a written record of all tests showing date, personnel conducting tests, equipment or material tested, tests performed, manufacturer and serial number of testing equipment and results.
- C. Tests to be accomplished as a minimum are as follows:
1. Control Panels: provide temporary power source to all control circuits and check for proper operation prior to energizing equipment served.
 2. Wires and Cables:
 - a. High-potential test shall be conducted on all service entrance conductors. The insulation resistance between conductors and also between conductors and ground shall be measured.
 - b. All other cables and wires shall be checked for continuity and shall be determined to be free of grounds prior to energizing.
 3. Motor Test: Motor rotation will be checked by momentary energizing of motor. Correction of rotation shall be made by changing leads on the motor. Motors shall only be energized in the presence of a representative of the OWNER.
 4. Check phase rotation on all bussing. Phasing shall be A-B-C, left to right, top to bottom, front to rear, as viewed from the front.
- D. CONTRACTOR shall be responsible for any damage to equipment or material due to improper test procedures or test apparatus handling and shall replace or restore to original condition any damaged equipment or material.
- E. CONTRACTOR shall furnish and use safety devices such as rubber gloves and blankets, protective screens, barriers, and danger signs to adequately protect and warn all personnel in the vicinity of the tests.

DEMONSTRATION OF COMPLETED ELECTRICAL SYSTEMS

- A. Upon the completion of the installation and testing, the CONTRACTOR shall demonstrate and familiarize representatives of the OWNER with the system.

END OF SECTION



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SECTION 30

DIESEL ENGINE DRIVEN GENERATOR WITH WEATHERPROOF ENCLOSURE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to install, put into operation, and field test the weatherproof diesel engine driven generator unit and appurtenances as shown on the Drawings and specified herein.
- B. These Specifications are intended to give a general description of what is required, but do not cover all details which will vary in accordance with the requirements of the equipment as offered. It is, however, intended to cover the furnishing, the shop testing, and delivery and complete installation and field testing, of all materials, equipment and appurtenances for the complete units as herein specified, whether specifically mentioned in these Specifications or not.
- C. For the unit there shall be furnished and installed all necessary and desirable accessory equipment and auxiliaries whether specifically mentioned in these Specifications or not. This installation shall incorporate the highest standards for the type of service shown on the Drawings. The CONTRACTOR is responsible for field testing of the entire installation and instruction of the regular operating personnel in the care, operation and maintenance of all equipment.

1.02 DESCRIPTION OF SYSTEM

- A. The engine-generator set shall be mounted as shown on the Drawings and shall be arranged for automatic starting and stopping, and load transfer upon failure of the normal source of power. The unit controls shall provide for automatic exercising on a weekly basis.

1.03 QUALIFICATIONS

- A. The proposed generator shall be a Caterpillar Package. Caterpillar generators are Standardized equipment and "or equal" generators will not be considered.
- B. It is the intent of this specification to secure a generator system that have been prototype tested, factory built, production tested, site tested and of the latest commercial design, together with all accessories necessary for a complete installation as shown on the plans and drawings, and specifications herein. The equipment supplied and installed shall meet the requirements of the NEC, along with all applicable local codes and regulations. All equipment shall be new, of current production of a national firm which manufactures the engine/generators and controls, and assembles the generator systems as a matched unit so that there is one-source responsibility for warranty, parts, and service through a local representative with factory-trained servicemen.
- C. Due to limited physical dimensions available at the site the unit must have the exact



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physical dimensions as follows:

1. Generator set and sound attenuated enclosure – 167 inches long by 48.5 inches wide by 93 inches tall.
- D. The unit shall be shipped to the jobsite by an authorized engine dealer having a parts and service facility within a 50 mile radius of the jobsite. In addition, and in order not to penalize the OWNER for unnecessary or prolonged periods of time for service or repairs to the emergency system, the bidding generator set supplier must have no less than eighty percent (80%) of all engine replacement parts locally available at all times. Certified proof of this requirement shall be furnished to the ENGINEER upon request.
- E. All materials and parts comprising the unit shall be new and unused, of current manufacture, and of the highest grade, free from all defects or imperfections. Workmanship shall conform to the best modern practices. Only new and current models will be considered. The units offered under these Specifications shall be the product of a firm regularly engaged in the production of engine-generator equipment and shall meet the requirements of the Specifications set forth herein. Major exceptions to Specifications will be considered sufficient cause for rejection of the machines.
- F. The generator set shall be listed to UL 2200.
- G. The Engine/Generator Unit shall be as follows:
 1. Engine/generator unit shall be a Caterpillar C2.2 diesel generator, 30KW. The unit shall operate at 240V, 0.8 power factor.

1.04 SUBMITTALS

- A. Submittals shall include prototype test certification and specification sheets showing all standard and optional accessories to be supplied, schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required for interconnection between the generator set and the transfer switch included elsewhere in these specifications.
- B. The successful bidder shall submit to the ENGINEER for review in accordance with other sections, complete sets of installation drawings, schematics, and wiring diagrams which shall show details of installation and connections to the work of other Sections, including foundation drawings showing location and size of foundation bolts for the pad type vibration isolators and brochures covering each item of equipment.
- C. In the event that it is impossible to conform with certain details of the Specifications due to different manufacturing techniques, describe completely all nonconforming aspects.
- D. The submittal data for each engine/generator set and sound attenuated, weatherproof enclosure shall include, but not necessarily be limited to, the following:
 1. Installation drawings showing plan and elevations of the complete generator unit; foundation plan; exhaust silencer; starting battery; battery charger; and sound attenuated, weatherproof enclosure.
 2. Engine Data:



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- a. Manufacturer
 - b. Model
 - c. Number of cylinders
 - d. RPM
 - e. Bore x stroke
 - f. BMEP at full rated load
 - g. Make and model and descriptive literature of electric governor
 - h. Fuel consumption rate curves at various loads
 - i. Engine continuous pump drive duty rating (without fan) HP
 - j. Gross engine horsepower to produce generator standby rating (including fan and all parasitic loads) HP
3. Generator Data :
 - a. Manufacturer
 - b. Model
 - c. Rated KVA
 - d. Rated SKVA
 - e. Rated KW
 - f. Voltage
 - g. Temperature rise above 40° C ambient
 - i) Stator by thermometer
 - ii) Field by resistance
 - iii) Class of insulation
 - h. Generator efficiency, including excitation losses, at 80% power factor
 - i) Full load
 - ii) $\frac{3}{4}$ load
 - iii) $\frac{1}{2}$ load
4. Generator Unit Control Data:
 - a. Actual electrical diagrams including schematic diagrams, and interconnection wiring diagrams for all equipment to be provided. Standard preprinted sheets are not acceptable.
 - b. Legends for all devices on all diagrams.
 - c. Sequence of operation explanations for all portions of all schematic wiring diagrams.
5. Engine/Generator Unit and Sound Attenuated, Weatherproof Enclosure: Dimensional data shall be given for each Engine/Generator set and for the weatherproof enclosure.
 - a. Weight of skid mounted unit
 - b. Overall length
 - c. Overall width
 - d. Overall height
 - e. Exhaust pipe size
 - f. CFM of air required for combustion and ventilation
 - g. Heat rejected to jacket water and lubricating oil - BTU/hr.



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- h. Heat rejected to room by engine and generator - BTU/hr.
 - i. Weatherproof enclosure details and certification of manufacturing method per specifications.
 - j. Data on all miscellaneous items supplied.
 - h. The generator enclosure and subbase diesel tank submittal shall include wind load calculations and anchorage calculations. All calculations shall be in accordance with the Florida Building Code (FBC).
- 6. Furnish the number of copies required of the MANUFACTURER'S certified shop test record of the complete engine driven generator unit.
- 7. Warranty information.
- 8. Submit to the ENGINEER operating and maintenance data.
- 9. Submit to the ENGINEER the equipment MANUFACTURER'S Certificate of Installation, Testing, and Instruction.
- 10. Submit to the ENGINEER the written warranty as required below.

1.05 TESTING:

- A. To assure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and local representative shall be responsible for three separate tests: design prototype tests, final production tests, and site tests.
- B. Design Prototype Tests: Components of the system such as the engine/generator set and accessories shall not be subjected to prototype tests since the tests are potentially damaging. Rather, similar design prototypes and preproduction models, which will not be sold, shall have been used for the following tests. Prototype test programs shall include the requirements of NFPA 110 and the following:
 - 1. Maximum power (KW).
 - 2. Maximum motor starting (KVA) instantaneous voltage dip.
 - 3. Alternator temperature rise by embedded thermocouple and by resistance method per NEMA MG1-2240 and 16.40.
 - 4. Governor speed regulation under steady-state and transient conditions.
 - 5. Voltage regulation and generator transient response.
 - 6. Fuel consumption at 1/4, 1/2, 3/4, and full load.
 - 7. Harmonic analysis, voltage waveform deviation, and telephone influence factor.
 - 8. Three-phase short circuit tests.
 - 9. Alternator cooling air flow.



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10. Torsional analysis testing to verify that the generator set is free of harmful torsional stresses.
11. Endurance testing.
- C. Final Production Tests: Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
 1. Single-step load pickup.
 2. Transient and steady-state governing.
 3. Safety shutdown device testing.
 4. Voltage regulation.
 5. Rated power.
 6. Maximum power.
 7. Upon request, arrangements to either witness this test will be made, or a certified test record will be sent prior to shipment.

1.06 SPECIAL TOOLS AND SPARE PARTS

- A. Furnish one (1) set of all special tools required for normal operation and maintenance of the equipment being furnished. Furnish suitable steel tool chests complete with locks and duplicate keys.
- B. The MANUFACTURER shall furnish two (2) complete spare replacement sets of all filter elements required for each generator unit supplied.
- C. The MANUFACTURER shall furnish one (1) complete set of belts required for each generator unit supplied.

PART 2 - PRODUCTS

2.01 RATINGS

- A. The standby rating of the generator sets shall not exceed the MANUFACTURER's published prime rating by more than 10%. The gross engine horsepower required to produce the standby ratings shall not exceed the MANUFACTURER's published continuous duty rating by more than 150 percent. Continuous duty rating shall be as defined in BS649 or DIN6270 but in no case shall it exceed the MANUFACTURER's published continuous duty rating for the engines as used in continuous rated pump drive applications. The gross engine horsepower required for the generator set standby ratings described above shall include all parasitic demands such as generator inefficiencies, fuel pumps, water pumps, radiator fan (for fan cooled models) and all accessories necessary to the unit's proper operation while operating at rated load and at a rotative speed not to exceed 1800 rpm.



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- B. The diesel engine driven generator set shall be capable of producing the specified standby KW rating for continuous electrical service during interruption of the normal utility source and shall be certified to this effect by the MANUFACTURER for the actual unit supplied.
- C. The Diesel Engine/Generator Units shall be 30kW (240 volts, 3-Phase, 4-wire, 60 Hertz) at 0.8 power factor with fan.

2.02 ENGINES

- A. The engine shall be full compression ignition, four cycle, single acting, solid injection engine, either vertical or "V" type. Speed shall not exceed 1800 revolutions per minute at normal full load operation. Multi block engines are not allowed. The engine governor shall be electronic type with a +/- 0.5 percent accuracy.
- B. The engine shall be capable of satisfactory performance on No. 2 fuel oil (ASTM Designation D396). Diesel engines requiring a premium fuel will not be considered.
- C. The engine shall be capable of operating at light loads for extended periods of time and shall provide a means to reduce carbonization. Periodic cleaning of exhaust ports shall not be required.
- D. The engine shall be equipped with fuel filters, lube oil filters, intake air filters, lube oil cooler, fuel transfer pump, fuel priming pump, service meter, engine driven water pump, and unit mounted instruments. Unit mounted instruments shall include a fuel pressure gauge, water temperature gauge, and lubrication oil pressure gauge. The engine shall be provided with low oil pressure, high water temperature, low coolant level and overspeed safety shutdowns of the manual reset type. Additional instruments and safety shutdowns shall be provided as noted herein.
- E. Injection pumps and injection valves shall be a type not requiring adjustment in service and shall be of a design allowing quick replacement by ordinary mechanics without special diesel experience. The engine shall have an individual mechanical injection pump and injection valve for each cylinder, any one of which may be removed and replaced from parts stock. Fuel injection pumps shall be positive action, constant-stroke pumps, activated by a cam driven by gears from the engine crankshaft. Fuel lines between injection pumps and valves shall be of heavy seamless tubing.
- F. The fuel system shall be equipped with fuel filters having replaceable elements. Filter elements shall be easily removable from their housing for replacing without breaking any fuel line connections, or disturbing the fuel pump, or any other part of the engine. All fuel filters shall be conveniently located in one accessible housing, ahead of the injection pumps so that the fuel will have been thoroughly filtered before it reaches the pump. No screens or filters requiring cleaning or replacement shall be used in the injection pump or injection valve assemblies. The engine shall be equipped with a built-in gear-type, engine-driven fuel transfer pump, capable of supplying fuel through the filters to the injection pump at constant pressure.
- G. In addition to the standard fuel filters provided by the engine MANUFACTURER, there shall also be installed a primary fuel filter and a water separator in the fuel inlet line to the engine.
- H. The engine shall have a gear-type lubricating oil pump for supplying oil under pressure to main bearings, crank pin bearings, pistons, piston pins, timing gears, camshaft bearings, valve rocker



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mechanism and governor. Effective lubricating oil filters shall be provided and so located and connected that all oil being circulated is continuously filtered and cleaned. Filters shall be accessible, easily removed and cleaned and shall be equipped with a spring-loaded by-pass valve as an insurance against stopping of lubricating oil circulation in the event the filters become clogged. The engines shall have a suitable water cooled lubricating oil cooler.

- I. The engine shall be provided with one or more engine mounted dry type air cleaners of sufficient capacity to protect effectively the working parts of the engine from dust and grit.
- J. During the initial start of the engine, a system shall be provided to pre-lube at low idle speed. When the internal oil pressure reaches a predetermined safe value, the engine will then increase to generator set operation speed.
- K. Mounting: The unit shall be mounted on a structural steel sub-base and shall be provided with pad type vibration isolators.
- L. The engine shall be EPA Tier 2 certified.

2.03 COOLING SYSTEMS

- A. The engine shall be furnished with a unit mounted radiator-type cooling system having sufficient capacity for cooling the engine when the diesel generator set is delivering full rated load in an ambient temperature not to exceed 110 degrees F. The engines shall be provided with a thermostatic valve placed in the jacket water outlet between the engine and the cooling source. This valve shall maintain the proper jacket water temperature under all load conditions. Total air restriction from the radiator shall not exceed 0.5 inches of water at both inlet and outlet. A flexible connecting section shall be provided between the radiator and discharge louver frame.
- B. Closed circuit jacket water system shall be treated with a rust inhibitor as recommended by the engine MANUFACTURER.
- C. The expansion tank of the radiator shall be fitted with a low water level switch and wired into the safety shutdown system of the unit.

2.04 GENERATOR, EXCITER AND ACCESSORIES

- A. Rating: The generator's KW ratings shall be as indicated in these specifications, 0.8 p.f., 1800 RPM, 3 phase, 4-wire, 60 Hertz, 240 volts, 12 leads, with a maximum temperature rise of 130 degrees C (both armature and field) by resistance at full rated load in ambient air of 40 degrees C. The generator shall conform to NEMA Standard MG-1.
- B. Performance: The instantaneous voltage dip shall not exceed 15 percent of rated voltage when any load is applied. Recovery of stable operation shall occur within 5 seconds. Steady state modulation shall not exceed + ½ percent.
- C. Construction:
 - 1. The generator and exciter shall be dripproof, with split sleeve, or ball race bearings. A shaft-mounted brushless exciter shall be a part of the assembly. The stator cores shall



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be built up of high grade silicon steel laminations precision punched, and individually insulated. Armature lamination followers and frame ribs shall be welded integral with the frames for support of the stator core. A directional blower shall be mounted on the unit to draw cooling air from the exciter and over the rotor poles and through louvered openings on the opposite end.

2. The exciter shall be a shaft driven PMG pilot exciter feeding the main's exciter, fast response type, with a rotating 3-phase full-wave bridge. The exciters shall have a low time constant and large capacity to minimize voltage transients under severe load changes.
3. The alternator shall be salient-pole, brushless, 12-lead reconnectable, self-ventilated of drip-proof construction with amortisseur rotor windings and skewed stator for smooth voltage waveform. The insulation shall meet the NEMA standard (MG1-33.40) for Class H and be insulated with epoxy varnish to be fungus resistant per MIL 1-24092. Temperature rise of the rotors and stators shall be limited to 130° C. The excitation systems shall be of brushless construction controlled by a solid-state voltage regulator capable of maintaining voltage within +/- 0.25% at any constant load from 0% to 100% of rating. The regulators must be isolated to prevent tracking when connected to SCR loads, and provide individual adjustments for voltage range, stability and volts-per-hertz operations; and be protected from the environment by conformal coating.
4. Generator rotor poles shall be built up of individually insulated silicon steel punchings. Poles shall be wound and bonded with high strength epoxy resin. Cage connections to the amortisseur rings shall be brazed for strong construction and permanent electrical characteristics. Each pole shall be securely bolted to the rotor shaft with bolts sized for the centrifugal forces on the rotor. Generator windings shall be braced for full line to ground fault currents, with solidly grounded neutral system.

D. Accessories and Attachments

1. Low Voltage Terminal Boxes: The generators shall have separate AC and DC low voltage terminal boxes with suitably numbered terminal strip for required connections.
2. Engine Water Heater: Thermostatically controlled and sized to maintain the manufacturer's recommended engine coolant temperature to meet start-up requirements of NFPA-99 and NFPA-110, Level 1. Power supply shall be 240 volts single phase.
3. Anti-condensation heater: Sized to prevent the accumulation of moisture or dampness in the alternator windings. Power supply shall be 120 volts single phase.

E. Generator Associated Controls:

1. Voltage Regulator:
 - i) The generator MANUFACTURER shall furnish a hermetically sealed, silicon controlled rectifier type voltage regulator employing a zener reference with a +1 percent regulation for the generator. The regulators shall include 3-phase voltage sensing, automatic short circuit protection and shall include automatic



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underfrequency protection to allow the generator to operate at no load at less than synchronous speed for engine start-up and shutdown procedures. Switches and/or fuses shall not be used to provide this protection. An over-voltage sensing module with manual reset shall be furnished with the regulator. A volts per Hz., sensing module shall be provided as part of the regulation system.

- ii) A voltage adjustment rheostat for 5 percent voltage adjustment on the unit shall be provided.
 - iv) High voltage step-down potential transformers shall be provided for the voltage regulator power input and sensing circuits if required.
2. Sustained Short Circuit: A permanent magnetic exciter shall be provided on the unit for sustaining a current of 300 percent during a short circuit, permitting the generator breaker to trip on overload. To prevent possible overheating of the armature windings, appropriate relaying shall be supplied to limit the fault to ten seconds.

2.05 SOUND ATTENUATED, WEATHER-PROTECTIVE ENCLOSURE

- A. The intent of this Specification is to provide the OWNER with sound attenuated, weatherproof type generator set enclosures complete in every detail and requiring no additional in-field modifications or assembly, except where specifically allows by these Specifications. The enclosure is to be accurately dimensioned so as to be in compliance with the National Electrical Code (NEC), and the National Fire Protection Association (NFPA) for clearance of all specified items included therein, and all applicable fire codes for a structure and application of this type.
- B. The enclosure shall conform to the following construction and design criteria as set forth.
 - 1. Rigidity wind test equal to 150 MPH
 - 2. Roof load equal to 75 lbs. per sq. ft.
 - 3. Rain test equal to 4" per hour
 - 4. Designed to Florida Building Code (FBC) and be provided with a Florida Department of Community Affairs Modular Building Insignia
 - 5. Four (4) copies of drawings signed and sealed by a Florida Professional Engineer.
 - 6. Note: An impact rated enclosure will be required.
- C. Enclosure shall consist of a roof, two (2) sidewalls, two (2) end walls, and be manufactured of formed aluminum components. The enclosure is to be provided with a means for securely attaching the entire structure to the base/fuel tank as specified within.
- D. Sidewalls and end walls shall be of formed 0.125 marine grade aluminum (the roof shall be 0.080"). The roof is to be bolted to both side and end walls to form a complete weather and wind resistance assembly.
- E. Wall framing shall be incorporated in the panels by forming an open back box structure. Skin material shall be minimum thickness .080" 3003 grade aluminum. Enclosure shall have a baked on powder-coat finish for maximum corrosion resistance. Exterior skin panels shall be integral to the wall



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structure and not separate pieces riveted onto framing members. Wall panels shall be no wider than 36" each and shall be removable without the use of special tools. Wall and roof panels shall be designed so that field replacement can be accomplished without disassembly of the entire structure if damage should occur.

- F. A minimum of sixteen colors shall be available for enclosure exterior. Standard enclosure exterior color is WHITE unless otherwise specified.
- G. Roof assembly shall be cambered to aid in rainwater runoff. Roof applications assemblies are to be mechanically fastened to the vertical wall sections. Glued or crimped roofs shall not be allowed nor considered as an acceptable alternative.
- H. Air handling shall be as follows: Air will enter the enclosure through a Hood, Plenum or Sound Attenuated Louvers/Baffles, as determined by the specific application and shall allow for the airflow demand for proper cooling to generator set package. The cooling air Inlet system shall prevent water intrusion into the enclosure with the generator set operating at full rated load while allowing for a maximum air restriction of less than 0.30" H₂O. Radiator Discharge shall be through a gravity operated extruded aluminum backdraft type damper and into a vertical discharge plenum or hood. Discharge plenum/hood shall discharge air upward and be provided with a means to positively drain any and all water entering the discharge device. Air discharge devices shall in no event restrict airflow by more than 0.25" H₂O. To ensure adequate airflow for cooling and combustion the static restriction over the entire system shall not exceed 0.50" H₂O. Both Intake and Discharge hoods and plenums shall be provided with removable bird/rodent screening to prevent the entrance of debris, birds, rodents and other vermin.
- I. All interior sidewalls shall contain non-asbestos thermal acoustic insulation with fire retardant properties. The insulation shall be completely covered by mill finish 0.050" perforated aluminum lining secured to the enclosure interior.
- J. Four-point lifting provisions shall be provided and have sufficient capacity suitable for rigging the entire Enclosure assembly.
- K. A minimum of two (2) single access doors shall be provided. Doors shall be manufactured of the same material as enclosure. Doors shall be fully gasketed to form a weather tight perimeter seal. Door hinges shall be full length stainless steel piano type and shall be attached with stainless steel hardware. Door handles shall be of a corrosion resistant material and shall provide for a lockable, secure entry point into the enclosure. Doors shall be insulated with no less insulation than is provided in the enclosure walls for sound attenuation.
- L. Enclosure manufacturer shall provide all necessary hardware to internally mount the exhaust silencer(s) specified herein. Silencer mounting hardware shall maintain the weatherproof integrity of the enclosure system. If the silencer is mounted internally it should discharge upward into the radiator discharge plenum or hood where possible, otherwise the enclosure manufacturer shall provide an aluminum rain collar and rain dress shield. Rain Collar and Dress Shield shall be manufactured of aluminum or stainless steel and designed as a circular fabricated part that does not require hole indexing by the installing contractor during site installation.
- M. As a minimum the enclosure shall provide an average 35db(A) sound reduction as measured at



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one meter, five feet above grade level under free field conditions to allow for a maximum of 75db(A) at 5 meters from the enclosure.

- N. Enclosure must bear the Florida Department of Community Affairs Modular Building Insignia.
- O. The enclosure shop drawing submittal shall include wind load and anchorage calculations in accordance with the latest FBC.
- P. Electrical Package:
 - 1. Lights to be controlled by 3-way switches located at each of the doors.
 - 2. Coolant Heater
 - 3. Anti-condensation heater
 - 4. Engine Starting Battery Charger
 - 5. Emergency Stop Pushbutton : Provide a NEMA 4X SS, Red, Mushroom-head emergency pushbutton that will immediately stop the generator upon activation. Provide a placard above the pushbutton to read "Generator Emergency Shut Down". Refer to drawings for pushbutton and placard location and details.
- Q. Due to limited physical space available at the site, the unit must have the physical dimensions as follows:
 - 1. Entire assembly of enclosure and sub base diesel fuel tank shall not exceed 167 inches in length. The assembly shall not exceed 48.5 inches in width.

2.06 EXHAUST SYSTEMS

- A. Exhaust Silencers - A critical type, side inlet, end outlet, Miratech or equivalent silencer and a flexible stainless steel exhaust fitting properly sized shall be furnished and installed according to the MANUFACTURER's recommendation. Mounting shall be provided by the CONTRACTOR as required. The silencers shall be mounted so that its weight is not supported by the engine nor will exhaust system growth due to thermal expansion be imposed on the engine. Exhaust pipe size shall be sufficient to ensure that exhaust back pressure does not exceed the maximum limitations specified by the engine MANUFACTURER. So called "spiral" or truck mufflers are disallowed and will not be considered as equal to the industrial quality silencers specified above.
- B. The silencers shall be fitted with a tail pipe extension and rain cap to prevent the entrance of rainwater.
- C. Rain Skirt - At the point where the exhaust pipe flexible tubing penetrates the roof of the enclosure, a suitable "rain skirt" and collar shall be provided by the MANUFACTURER. It shall be designed to prevent the entrance of rain and allow for expansion and vibration of the exhaust piping without chafing or stress to the exhaust system. This detail must appear on the drawings submitted for approval.



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2.07 AUTOMATIC STARTING SYSTEM

- A. Starting Motor - A DC electric starting system with positive engagement shall be furnished. The motor voltage shall be 12 volts.
- B. Automatic Control - Fully automatic engine start-stop controls in the generator control panels shall be provided. Controls shall provide shutdown for low oil pressure, high water temperature, overspeed, overcrank, and loss of engine coolant. Alarms for approaching high water temperature and impending low oil pressure shall also be included. Controls shall include a 30-second single cranking cycle limit with lockout or a cyclic crank system with lockout and overcrank protection.
- C. Batteries - A lead-acid storage battery set of the diesel starting type shall be provided. Battery voltage shall be 12 volts, and the battery set shall be rated no less than 90 ampere hours. Necessary cables and clamps shall be provided.
- D. Battery Trays - battery trays shall be provided for the batteries and shall conform to NEC 480-7(b). It shall be constructed of fiberglass and so treated as to be resistant to deterioration by battery electrolyte. Further, construction shall be such that any spillage or boil-over of battery electrolyte shall be contained within the tray to prevent a direct path to ground.
- E. Battery Chargers - A current-limiting, automatic 12 volt DC charger shall be furnished to automatically recharge batteries. Charger shall float at 2.17 volts per cell and equalize at 2.33 volts per cell. It shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressor, DC ammeter, DC voltmeter, and fused AC input. AC input voltage shall be 120 volts, single phase. Amperage output shall be no less than ten (10) amperes. Chargers shall be wall mounting type in NEMA 1 enclosure, and U.L. listed as an industrial control panel. The chargers shall be as manufactured by SENS per NFPA 110 and U.L. 508. The chargers shall be mounted and wired within the enclosure for the generator set by enclosure manufacturer.

2.08 MAIN LINE CIRCUIT BREAKER

- A. Type - Main line, 600 volt, 80% rated, molded case circuit breaker mounted upon and sized to the output of the generator shall be installed as a load circuit interrupting and protection device. It shall operate both manually for normal switching functions and automatically during overload and short circuit conditions.
- B. The trip unit for each pole shall have elements providing inverse time delay during overload conditions and instantaneous magnetic tripping for short circuit protection. The circuit breaker shall meet standards established by Underwriters Laboratories, National Electric Manufacturers Association, and National Electrical Code.
- C. Generator exciter field circuit breakers do not meet the above electrical standards and are unacceptable for line protection.
- D. Circuit breaker shall have battery voltage operated shunt trip wired to safety shutdowns to open the breaker in the event of engine failure.
- E. The rating of the circuit breakers shall allow the starting of full generator SKVA.



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- H. The circuit breaker enclosure, together with all specified circuit breakers, shall be designed for the specific generator set specified and be equipped with rear copper stabs, or load cable lugs and be finish painted to match the generator set.

2.09 GENERATOR CONTROL PANELS

- A. Type - A generator-mounted, NEMA 1 type, vibration isolated, 14-gauge steel control panel shall be provided for the generator set.
- B. Control panel shall be Caterpillar standard offering.
- C. Regulation of NFPA 110 Level 2 shall apply for instrumentation, alarm and shutdown. The instrumentation panel shall include, but not necessarily be limited to:
1. Gages for engine: digital or analog gages with $\pm 2\%$ full scale accuracy :
 - a. Oil Pressure
 - b. Engine Coolant Temperature
 - c. Voltmeter for DC Battery
 2. Gages for generator: digital or analog gages with $\pm 2\%$ full scale accuracy :
 - a. AC Ammeter : Dual range
 - b. AC Voltmeter : Dual range
 - c. Frequency Meter : Range of 45-65 Hz.
 3. Elapsed Time Meter.
 4. 0-3000 RPM Tachometer - digital or analog gage with $\pm 2\%$ full scale accuracy.
 5. A seven position phase selector switch with – OFF position to show meter display of current and voltage of each generator phase. This selector switch may be manual or push-button.
 6. A power source with circuit protection – 12 or 24 VDC.
 7. An AC interlock to prevent starter re-engagement with engine running.
 8. DC circuit protection.
 10. Eight (8) individual fault indicator lights for:
 - a. Overcrank Shutdown – Red
 - b. Overspeed shutdown – Red
 - c. High Coolant Temperature – Red
 - d. Low Engine Oil Pressure – Red
 - e. High Engine Coolant Temperature Prealarm – Yellow
 - f. Low Engine Oil Pressure Prealarm – Yellow
 - g. Low Fuel – Yellow



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h. Run – Green

D. Switches and Controls

1. Rheostat for adjusting output voltage of the generator to $\pm 5\%$ of nominal voltage.
2. Over voltage protection shutdown switch.
3. Emergency stop switch mounted on control panel.
4. Engine start switch – with Run, Off, Reset, Automatic positions.
5. Five minute engine cool down timer.
6. Cyclic cranking switch.

E. Dry contacts for remote generator running indication, remote generator fail indication and cranking battery low voltage indication wired to terminal strips. Refer to drawings for required conduit/conductors.

F. All electrical penetrations in any enclosure shall be properly sealed from the weather.

G. Digital or solid state meters or metering devices shall be acceptable as a substitute for the electromechanical devices specified.

H. Engraved, screw-on type nameplates will identify each function indicated without abbreviation of function description. So-called international symbols will not be acceptable substitutes for this mandatory requirement.

I. Timing Functions - All control panel timing functions shall be accomplished by metal encased, solid-state, plug-in timing relays with 2PDT output contacts rated for ten (10) amperes. All solid-state time delay relays shall be reverse polarity protected and shall not function or be damaged by the application of improper polarity. Open printed circuit board type time delay circuits will not be accepted.

J. Control Relays - All control relays shall be the 3PDT plug-in type with .187QC blade terminals rated for (10) amperes. Each relay shall be equipped with a manual push to operate check button, L.E.D. or neon visual indicator, and see-thru dust cover for contact inspection and protection. Exposed contact and octal base plug-in relays are not acceptable.

K. Relay Sockets - All relay sockets shall be of the molded thermoplastic type, suitable for snap mounting on standard D.I.N. rail. Relay sockets will have wire clamp type terminals for secure wire connections, and one (1) piece bus bar connectors between the actual relay blade and wire clamp terminal. Relay sockets shall be rated for fifteen (15) amperes at 300V. Printed circuit board type relay sockets and relay sockets with push-on quick connect terminals are not acceptable.

2.10 GENERATOR FUEL SYSTEM



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A. UL 142, FDEP Sub Base Fuel Tank as follows:

1. Sub base diesel storage tank sized to provide a minimum of approximately 48 hours of runtime between refueling at full load.
2. 3/16" Mild Steel Secondary Tank.
3. Rupture Basin with FDEP Approved Leak Detection Switch (Madison M-7000 EQ#682).
4. Diesel Tank Level transmitter with 4-20mA output.
5. Mechanical Fuel Level Gauge (Visible at Fill Point).
6. Supply and Return Connections.
7. 2" Fill with Lockable Cap with FDEP spill containment.
8. Normal and Emergency Vent Fittings Installed Per UL 2085.
9. Low Level Fuel Alarm Switch (FPI LS1001 EQ#817). Set at 40% remaining capacity wired to Control Panel Terminal Strip.
10. High Level Fuel Alarm Switch (FPI LS1001 EQ#817). Set at 90% tank capacity wired to Control Panel Terminal Strip. Provide local red alarm light and local audible alarm to indicate high level during fueling
11. Cable Stub Up Opening Under Circuit Breaker.
12. Generator Mounting Pads.
13. Mounting provisions shall allow for a minimum 2" airspace between concrete slab and secondary tank to facilitate inspection and maintenance of tank bottom. Designs that do not incorporate spacing between the tank bottom and the concrete pad will not be accepted.
14. 2 Lifting Points per Side (4 Total) for Lifting Generator Set, Enclosure and Tank (Empty).
15. Tank coated with Two Part Epoxy Primer and painted Gloss Black.
16. Tank shall be provided with steps welded to the side of diesel tank to accommodate access to the interior of the enclosure.
17. Tank sealed and shipped under vacuum per Florida Administrative Code Chapter 62-762 and NFPA30.
18. Tank shall be manufactured by Phoenix Products of Jacksonville, Florida. Alternate manufacturers must provide submittal data to the OWNER and ENGINEER for approval no less than fourteen (14) calendar days prior to bid date in order to be considered. Submission of equipment does not guarantee approval. Submittals deemed unsatisfactory upon initial review will not be allowed to be modified and/or resubmitted



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after initial review.

PART 3 - EXECUTION

3.01 GENERATOR SET FIELD QUALITY CONTROL

- A. A factory authorized service representative of the product supplied, shall inspect all field assembled and installed components and make any necessary corrections to insure proper equipment operation. Any cost associated with this procedure shall be born by the contractor.

3.02 GENERATOR SET TRAINING AND DEMONSTRATION

- A. A factory representative of the product shall provide the City's maintenance personnel with a thorough period of instruction and hands-on session regarding the operation, trouble shooting and maintenance of all components of the product. Typical training period : one hour.
- B. At least seven business days of notice shall be given by the Contractor to the City for delivery, installation, testing training and demonstration of the product.

3.03 GENERATOR TESTING

- A. The engine-generator sets shall be given the MANUFACTURER'S standard factory load test prior to shipment.
- B. Prior to final acceptance of the generator set, all equipment furnished under this Section shall be field tested per NFPA 110 to show it is free of any defects and the generator set can operate satisfactorily under full load test using resistance type load banks (brine tanks not acceptable). Test shall be for four (4) continuous hours. Any defects which become evident at this time shall be corrected before acceptance.
- B. An all-in-place static alignment check of all rotating components shall be made prior to first start-up, after unit is secured in place and all final connections are made.
- D. Site Tests: An installation check, start-up and load test shall be performed by the manufacturer's local representative. The Engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
 - 1. Fuel, lubricating oil, an antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
 - 2. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: coolant heater, battery charger, anti-condensation heater, annunciator, etc.
 - 3. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage, and phase rotation.
 - 4. Automatic start-up by means of simulated power outage to test remote-automatic



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starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination.

5. External load bank tests shall be performed with the following criteria:

- i) One (1) hour at 25% load
- ii) One (1) hour at 50% load
- iii) One (1) hour at 75% load
- iv) One (1) hour at 100% load

Engine coolant temperature, oil pressure, and battery charge level along with generator voltage, amperes, and frequency shall be monitored throughout the load bank tests and a written report shall be provided to the OWNER and ENGINEER for record purposes. If, for any reason, any of the one hour load bank tests are interrupted, the associated test shall be repeated.

E. A final alignment check and/or adjustment shall be made successful completion of the load bank tests.

3.04 GENERATOR SET SPARE PARTS

A. The spare parts shall include, but not necessarily be limited to the following:

- 1. Six (6) Fuses of each type and size used.
- 2. One (1) Oil, air and fuel filter.
- 3. One (1) set of belts.
- 4. One (1) of each special tool or device, if any, required to maintain the generator set and included equipment.

3.05 WARRANTY

A. Equipment furnished under this Section shall be guaranteed against defective parts and workmanship under terms of the MANUFACTURER'S and dealer's warranty. But, in no event, shall it be for a period of less than five (5) years and 2,500 operating hours from date of acceptance of the system by the city of Tampa and shall include labor, parts and travel time for necessary repairs at the job site. Submittal data received without written warranties as specified will be rejected in their entirety.

END OF SECTION



SECTION 16050

ELECTRICAL - GENERAL PROVISIONS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for complete electrical system for the City of St. Pete Beach's Lift Station Rehabilitation as hereinafter specified and shown on the Drawings.
- B. The work, apparatus and materials, which shall be furnished under these Specifications and accompanying Drawings, shall include all items listed hereinafter and/or shown on the Drawings. Certain equipment, which will require wiring thereto and/or complete installation, is indicated. All materials necessary for the complete installation shall be furnished and installed by the CONTRACTOR to provide complete power, lighting, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein.
- C. The CONTRACTOR shall furnish and install the necessary cables, protective devices, conductors, supports, raceways, exterior electrical system, etc., to serve lighting loads and miscellaneous electrical loads as indicated on the Drawings and/or as specified. The CONTRACTOR shall install any control panel provided under this or any other sections on the specifications.
- D. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; sub-standard work will be rejected.
- E. For process instrumentation furnish and install all conduit, wire and interconnections between primary elements, transmitters, local indicators and receivers.
- F. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work, which may be reasonably implied as being incidental to the work of this Section, shall be furnished at no extra cost.

1.02 CODES, INSPECTION AND FEES

- A. All material and installation shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes, laws and ordinances.
- B. Pay all fees required for permits and inspections.

1.03 TESTS

- A. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct OWNER's personnel in the proper operation of the systems.



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- B. The following minimum tests and checks shall be made prior to the energizing of electrical equipment. Test shall be by the CONTRACTOR and a certified test report shall be submitted providing all test results and stating that the equipment meets and operates in accordance with the Manufacturer's and job specifications, and that equipment and installation conforms to all applicable Standards and Specifications:
 - 1. Test all 600-volt wire insulation with a megohm meter after installation. Make tests at not less than 1000 volts. Submit a written test report of the results to the engineer.
 - 2. Mechanical inspection of all circuit breakers to assure proper operation.
- C. The Engineer shall be notified forty-eight (48) hours before tests are made to enable the Owner to have designated personnel present.

1.04 CUTTING AND PATCHING

- A. All cutting and patching shall be done in a thoroughly workmanlike manner.

1.05 INTERPRETATION OF DRAWINGS

- A. The Drawings are not intended to show exact locations of conduit runs.
- B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.
- C. Unless otherwise approved by the Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
- D. Where circuits are shown as "home-runs," all necessary fittings and boxes shall be provided for a complete raceway installation.
- E. The CONTRACTOR shall harmonize the work of the different trades so that interferences between conduits, piping, equipment, architectural and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets, fittings, etc., required to accomplish this shall be furnished and installed by the CONTRACTOR without additional expense to the Owner. In case interference develops, the Owner's authorized representative is to decide which equipment, piping, etc., must be relocated, regardless of which was installed first.
- F. The locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
- G. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.
- H. The ratings of motors and other electrically operated devices together with the size shown for their branch circuit conductors and conduits are approximate only and are indicative of the probable power requirements insofar as they can be determined in advance of the purchase of equipment.



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- I. All connections to equipment shall be made as shown, specified and directed and in accordance with the approved shop drawings, regardless of the number of conductors shown on the Electrical Drawings.

1.06 RECORD DRAWINGS

- A. As the work progresses, legibly record all field changes on a set of project Contract Drawings. When the project is complete, furnish a complete set of reproducible "As-built" drawings for the Project Record Documents.

1.07 COMPONENT INTERCONNECTIONS

- A. Component equipment furnished under this Specification will not be furnished as integrated systems.
- B. Analyze all systems components and their shop drawings; identify all terminals and prepare drawings or wiring tables necessary for component interconnection.

1.09. WARRANTY

- A. Provide a warranty for all the electrical equipment in accordance with the requirements of other Sections. Under no circumstances shall the warranty be for less than one year starting from substantial completion.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION



SECTION 16075

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Labels.
 - 3. Wire markers.
 - 4. Lockout Devices.

1.02 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Division 1 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept identification products on site in original containers. Inspect for damage.
- C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Division 1 - Product Requirements: Environmental conditions affecting products on site.
- B. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.01 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved white letters on black background color.
- B. Letter Size:



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1. 1/8 inch high letters for identifying individual equipment and loads.
2. 1/4 inch high letters for identifying grouped equipment and loads.

C. Minimum nameplate thickness: 1/8 inch.

1.05 LABELS

A. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

1.06 WIRE MARKERS

A. Description: Cloth tape, split sleeve, or tubing type wire markers.

B. Legend:

1. Power and Lighting Circuits: Branch circuit or feeder number.
2. Control Circuits: Control wire number as indicated on shop drawings.

1.07 LOCKOUT DEVICES

A. Lockout Hasps:

1. Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.

PART 3 – EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

A. Nameplate Installation:

1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
4. Secure nameplate to equipment front using screws or adhesive.
5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
6. Install nameplates for the following:
 - a. Data Flow Systems Control Panel.
 - b. Service Entrance Disconnect.
 - c. Devices as indicated on the drawings.



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- B. Wire Marker Installation:
1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
 2. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
 3. Install labels at data outlets identifying patch panel and port designation.

END OF SECTION



SECTION 16120

CONDUIT AND CONDUCTORS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for complete electrical system for the City of St. Pete Beach's Lift Station Rehabilitation project, as hereinafter specified and shown on the Drawings.

1.02 CODES

- A. All material and installation shall be in accordance with the latest edition of the National Electrical Code (N.E.C.), and NFPA 70 code articles that are applicable to the minimum electrical installation requirements for sewer lift stations.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or Manufacturer's specifications shall be submitted for approval as required by the Engineer.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed and conform with applicable standards of NEMA and ANSI.
- C. Electrical equipment shall, at all times during construction, be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the CONTRACTOR at his expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such special tests as directed by the Engineer, at the cost and expense of the CONTRACTOR, or shall be replaced by the CONTRACTOR at his own expense.

2.02 RACEWAYS AND FITTINGS

- A. All raceways installed above ground shall be Rigid Aluminum Conduit (RAC).
- B. Raceways installed below grade shall be PVC schedule 40 conduit.
- C. Where conduit is cut, the inside edge shall be reamed smooth to prevent injury to conductors.



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2.03 CONDUCTORS

- A. Conductors shall be copper. Power circuits shall have 600 volt insulation (Underwriters' approved Type THWN). Conductors shall be color coded in accordance with the NEC.
- B. All motor controls, remote indicating lights, alarm circuits and metering loops shall be wired with #14 stranded copper conductors. Insulation shall be THWN. An overall PVC jacket shall be provided for multi-conductor cables where required by the drawings.
- C. All shielded instrumentation cable shall be 2/C#16 shielded with 600 volt insulation and PVC outer jacket, Belden 8719

2.04 MISCELLANEOUS EQUIPMENT

- A. Boxes and Fittings:
 - 1. NEMA 4X boxes shall be used outdoors or in "wet" locations. Construction shall be 316 stainless steel.
 - 2. Conduit hubs shall be used for all outdoor conduit terminations and shall be as manufactured by Meyers Electric Products, Inc., Raco Div., Appleton Electric Co., or approved equal.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION

- A. Where conduits enter or leave all outlet boxes, cabinets safety switches, tap boxes, motor controllers, etc., threaded hubs shall be used. Bushings 1-inch and larger shall be of an approved insulated type. Unless otherwise indicated, conduit 2-inches shall be supported at intervals not exceeding ten (10) feet.
- B. During construction, all installed raceways shall be temporarily plugged or otherwise protected from the entrance of moisture, dirt, trash, plaster, moisture, etc., through neglect of the CONTRACTOR to so protect them, shall be replaced by the CONTRACTOR without additional expense to the Owner. No kinked, clogged or deformed raceways will be permitted on the job. Raceways shall be cut to proper length so that ends will fit accurately in the outlets. Where raceways cross building expansion joints, a suitable raceway expansion fitting shall be used.
- C. Size of raceway shall not be less than NEC requirements, but in no case shall be less than indicated on the Drawings. Combining of circuits, other than detailed, will not be permitted. The CONTRACTOR shall install larger size raceways than detailed where there is excessive length of unbroken run or excessive number of bends.
- D. Bends in metallic raceways shall be made while "cold" and in no case shall the raceways be heated. Raceways shall not be bent through more than 90°. The radius of bends shall not be less than six (6) times the internal diameter of the raceway. Not more than



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four (4) (equivalent 90°) bends will be permitted between outlets, the bends at the outlets being counted.

- E. Raceways shall be properly aligned, grouped and supported. Exposed raceways shall be installed at the right angles to or parallel to the principal structural members. Concealed raceways, unless otherwise indicated, may take the most direct route between outlets. Raceways shall be firmly held in place. Raceways shall run to avoid trapping wherever possible. Where areas are indicated for future openings, foundations, etc., all raceways shall be run around such areas. The CONTRACTOR shall provide necessary inserts in poured concrete areas and shall furnish and install all necessary sleeves through walls, floors and roofs for passage of raceways. Sleeves through roofs and/or exterior walls shall be properly sealed by the CONTRACTOR against entrance of moisture, etc., into the building. Where necessary repairs to the building structure using material in no way inferior to that originally installed and using labor skilled in the trades involved.

3.02 CONDUCTORS

- A. Splices, taps and attachments of fittings and lugs shall be electrically and mechanically secure. Approved solderless lugs and connectors shall be used for all conductors with 2-bolt type being used for sized No. 4/0 and larger. There shall be plenty of slack cable in boxes, outlets and cabinets to insure that there is no binding at the bushings. All lugs shall be of the correct sizes for the conductor in order to fit the conductor into a lug. Taping of joints shall be either with Scotch electrical tape or varnished cambric tape and friction tape to secure insulation strength equal to that of the conductors joined.
- B. Splices or joints with friction tape outer covering in conductors of size No. 4 AWG or larger shall have three (3) coats of suitable insulating varnish paint applied over tape. Conductors shall be color coded in accordance with NEC.

3.03 GROUNDING

- A. The entire electrical system shall be completely and effectively grounded as required by the NEC and as specified hereinafter.
- B. All metallic raceways shall be mechanically and electrically secure at all joints and at all boxes, cabinets, fittings and equipment. Metallic raceways entering the motor control center control panels or other electrical boxes shall be grounded to the appropriate ground bus. All metallic raceways shall be electrically continuous throughout the entire conduit system. Bond wires shall be used in exterior concrete pull boxes.

3.04 SUPPORTS

- A. The CONTRACTOR shall furnish and install all necessary supports for properly mounting all electrical equipment and raceways. Such supports shall be fabricated and installed in a neat and workmanlike manner, and care shall be taken that at no time shall any portion of the building structure be overloaded. Should the building structure sustain damage through carelessness or through failure of the CONTRACTOR to properly support and install the electrical equipment, the CONTRACTOR shall bear all costs involved in repairing or replacing such installation.
- B. All steel shapes exposed to the weather shall be galvanized after all cutting, drilling, and/or welding is done. All shop connections shall be welded or riveted and all field connections shall be bolted on all outdoor structures. Where the field cutting or drilling of



galvanized steel is necessary, the CONTRACTOR shall apply one (1) coat of priming paint and one (1) finish coat of aluminum and oil paint.

- C. All conduit support systems (unistrut or equivalent), support system hardware (nuts, bolts, etc.) and conduit clamps shall be 316 stainless steel.

3.05 TESTS AND CHECKS

- A. The following minimum tests and checks shall be made prior to the termination of any field wiring.
1. Megger terminals and buses after disconnecting devices sensitive to megger voltage.
 2. A 1,000V DC megger shall be used for these tests.
 3. The first test shall be made with main circuit breaker closed and all remaining breakers open. A second test shall be made with all circuit breakers closed.
 4. The test results shall be recorded and forwarded to the Engineer for his review. Minimum megger readings shall be 100 megohms in both tests.
- B. The following shall be done before energizing any motor control center or control panel.
1. Remove all current transformer shunts after completing the secondary circuit.
 2. Install overload relay heaters based on actual motor nameplate current.
 3. Vacuum clean all interior equipment.

END OF SECTION



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SECTION 16140

WIRING DEVICES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Requirements for providing, wiring devices and appurtenances as indicated, in accordance with the Contract Documents.

1.02 REFERENCES

- A. Codes and standards referred to in this Section are:
1. Fed Spec WC 596 - Electrical Power Connector, Plug, Receptacle and Cable Outlet
 2. Fed Spec WS 896 - Toggle and Lock, Flush Mounted Switches
 3. CSA C22.2-182.1 - Industrial-type, Special-Use Attachment Plugs, Receptacles and Connectors
 4. UL 20 - General - Use Snap Switches
 5. UL 498 - Attachment Plugs and Receptacles
 6. UL 508 - Industrial Control Equipment
 7. UL 894 - Switches for Use in Hazardous (Classified) Locations
 8. UL 1010 - Receptacle-Plug Combinations for Use in Hazardous (Classified) Locations
 9. UL 1682 - Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type
 10. UL 1686 - Standard for Pin and Sleeve Configurations

1.03 SUBMITTALS

- A. General: Furnish all submittals, including the following, as specified elsewhere.

1.04 DELIVERY, STORAGE AND HANDLING

- A. General: Deliver, store and handle all products and materials as specified the Specific/General Provisions.



PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Standard of Quality and General Configuration: Use of manufacturer's name and model or catalog number is for the purpose of establishing the desired quality and configuration.
- B. Configuration and Rating: Provide NEMA specification grade wiring devices in the type, color, configuration and electrical rating for the service indicated.
- C. Symbols: See the electrical symbol list shown for identification of all device types.
- D. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted for review.
 - 1. Hubbell Inc. Wiring Device/Kellems Division
 - 2. Pass and Seymour
 - 3. Cooper Wiring Devices
 - 4. Leviton
 - 5. Appleton Electric Company
 - 6. Crouse-Hinds Company
 - 7. Thomas & Betts

2.02 LIGHTING TOGGLE SWITCHES

- A. General: Provide toggle switches of specification grade rated 20- amperes, 120-277 volts ac conforming to Fed. Spec. WS 896 and UL Standard 20. Manufacture switches with back and side wired binding screw type terminals, one piece spring contact arm and terminal plate with silver alloy contacts, one piece steel mounting strap with an assured grounding clip, thermoset body color coded

for identification by amperage and a brown toggle. Provide ivory toggles in finished areas.

- B. Types:

DESCRIPTION	HUBBELL CAT. NO.
Single pole	HBL1221
Three way	HBL1223

2.04 CONVENIENCE RECEPTACLES

- A. General: Provide specification grade convenience receptacles conforming to Fed. Spec. WC 596 UL listed, with nylon impact resistant face, one piece metal wrap around mounting strap with assured grounding clip, back and side wired binding screw type



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terminals, brass power contacts and a heavy duty heat stabilized thermoset plastic base. Provide brown devices in unfinished areas and ivory devices in finished areas unless otherwise specified.

B. TYPES:

DESCRIPTION	RATING	COLOR	HUBBELL CAT. NO.
Duplex	NEMA 5-20R 20A, 125V, 2P, 3W	Ivory	HBL5362I

2.05 BOXES

- A. Outlet Boxes: Provide outlet boxes in accordance with the requirements specified in Section 26 05 33.

2.07 PLATES AND COVERS

- A. General: Provide covers and plates for the various areas as follows:

1. Outdoor Areas:
 - a. Provide weatherproof, gasketed, covers.
1. Indoor Areas:
 - a. Provide aluminum plates.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Install all wiring devices in accordance with manufacturer's recommendations and approved shop drawings.
- B. Toggle Switches: Install toggle switches applicable for the area environment for switching lighting or other branch circuit loads.
- C. Receptacles: Install receptacles applicable for the area environment.
- D. Grounding: Ground all devices in accordance with the requirements specified in Section 16450.

END OF SECTION



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SECTION 16190

SUPPORTING DEVICES

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Conduit supports.
- B. Channel supports for equipment.

1.02 REFERENCE STANDARDS

- A. National Electrical Code

PART 2 - PRODUCTS

2.01 CONDUIT SUPPORTS

- A. Single Runs: Aluminum conduit clamps. Plumbers perforated straps or wire will not be acceptable.
- B. Multiple Runs: Conduit rack with 25 percent spare capacity.
- C. Vertical Runs: Channel support with conduit fittings.

2.02 CHANNEL SUPPORTS

- A. Channel sections shall be 316 stainless steel.
- B. The cross sectional width dimension of the channel shall be a minimum of 1-5/8-inch. The depth will be as required to satisfy the load requirements. Channel with 1-5/8-inch depth or greater shall be standard 12 gauge stainless steel.
- C. Attachment holes, when required, shall be factory punched on hole centers equal to the channel cross sectional width dimension and shall be a maximum of 9/16-inch in diameter.
- D. Channel attachment nuts shall be designed to prelocate in the channel and provide a bearing surface on the turned down lips while making positive contact with the side walls of the channel.
- E. Straps for the support of conduit shall be designed such that the attachment nut is captivated on the shoulder of the strap when tightened, and the attachment bolt shall allow tightening by either a screwdriver or wrench.
- F. All nuts, bolts, straps, threaded rod and edges of punched holes shall be protected with the same finish as the channel.
- G. When tested in accordance with ASTM B117-73 procedure, there shall be no sign of red rust after 1,000 hours of testing. Certified test results to support this must be submitted upon request.



2.03 ANCHOR METHODS

- A. Hollow Masonary: Toggle bolts or tapcons.
- B. Solid Masonary: Tapcons.
- C. Metal Surfaces: machine screws, bolts, welded studs, or beam type clamps on steel joints.
- D. Wood Surfaces: Wood Screws
- E. Concrete Surfaces: Tapcons.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Layout to maintain headroom, neat mechanical appearance, and to support equipment loads required.
- B. Verify exact mounting and installation requirements with the Owner's representative prior to installation.

END OF SECTION



SECTION 16450

GROUNDING SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install a complete grounding system in strict accordance with Article 250 of the National Electrical Code and as hereinafter specified and shown on the Drawings.

1.02 RELATED WORK

- A. Wire and conduit shall be as specified under Section 16120.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Ground rods: Ground rods shall be Copperclad steel 3/4-inch x 20 foot. Ground rods shall be Copperweld or be an approved equal product.

PART 3 - EXECUTION

3.01 GENERAL

- A. Grounding electrodes shall be driven as required. Where rock is encountered, grounding plates may be used in lieu of grounding rods.
- B. All equipment enclosures, motor and transformer frames, conduits systems, cable armor, exposed structural steel and similar items shall be grounded.
- C. All connections shall be made by welding process equal to Cadweld.
- E. All underground conductors shall be laid slack and where exposed to mechanical injury shall be protected by pipes or other substantial guards. If guards are iron pipe or other magnetic material, conductors shall be electrically connected to both ends of the guard.
- F. The Contractor shall exercise care to insure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.

3.02 TESTS

- A. The Contractor shall test the ground resistance of the system. All test equipment shall be provided by the Contractor and approved by the Engineer. Dry season resistance of the system shall not exceed 2 ohms. If such resistance cannot be obtained with the system as shown, the Contractor shall provide additional grounding as directed by the Engineer, without additional payment. The Contractor shall submit all grounding system test results to the Engineer for review.



SECTION 16495

AUTOMATIC TRANSFER SWITCH

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install automatic transfer switch (ATS) with four (3) poles, solid neutral, rated for 150 amperes, 240Volts, withstand and close-on ratings of 22,000 RMS symmetrical amperes minimum. Automatic transfer switch shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. Transfer switch and controller shall be the products of the same manufacturer. Transfer switch shall be delayed transition type. Conductors for Normal Power shall connect at the top of the ATS. Conductors for Emergency Power shall connect at the bottom of the ATS.

1.02 CODES AND STANDARDS

The automatic transfer switches and controls shall conform to the requirements of:

- A. UL 1008 - Standard for Transfer Switch Equipment
- B. CSA certified to CSA 22.2 No. 178 – 1978 Automatic Transfer Switches
- C. IEC 60947-6-1 Low-voltage Switchgear and Controlgear; Multifunction equipment; Automatic Transfer Switching Equipment
- D. NFPA 70 - National Electrical Code
- E. NFPA 99 - Essential Electrical Systems for Health Care Facilities
- F. NFPA 110 - Emergency and Standby Power Systems
- G. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- H. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
- I. UL 508 Industrial Control Equipment

1.03 ACCEPTABLE MANUFACTURERS

Automatic transfer switch shall be ASCO 300 Series.

PART 2 - PRODUCTS

2.01 MECHANICALLY HELD TRANSFER SWITCH



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- A. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.
- B. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.
- C. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.
- D. All main contacts shall be silver composition. Switches rated 800 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 800 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.
- F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- G. The neutral conductors must be solid as indicated in this specification.
- H. Contractor to provide a fully rated ground bus with AL-CU lugs as required.

2.02 MICROPROCESSOR CONTROLLER

- A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.
- B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to $\pm 1\%$ of nominal voltage. Frequency sensing shall be accurate to $\pm 0.2\%$. The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C.
- C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and



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ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.

- D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.
- E. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
 - 1. EN 55011:1991 Emission standard - Group 1, Class A
 - 2. EN 50082-2:1995 Generic immunity standard, from which:
 - 3. EN 61000-4-2:1995 Electrostatic discharge (ESD) immunity
 - 4. ENV 50140:1993 Radiated Electro-Magnetic field immunity
 - 5. EN 61000-4-4:1995 Electrical fast transient (EFT) immunity
 - 6. EN 61000-4-5:1995 Surge transient immunity
 - 7. EN 61000-4-6:1996 Conducted Radio-Frequency field immunity

2.03 ENCLOSURE

- A. The ATS shall be mounted in a NEMA 4X 316 stainless steel wall-mounted enclosure.

PART 3 - OPERATION

3.01 CONTROLLER DISPLAY AND KEYPAD

- A. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:
 - 1. Nominal line voltage and frequency
 - 2. Single or three phase sensing
 - 3. Operating parameter protection
 - 4. Transfer operating mode configuration (Open transition, Closed transition, or Delayed transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

3.02 VOLTAGE, FREQUENCY AND PHASE ROTATION SENSING

- A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout, and trip setting capabilities



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(values shown as % of nominal unless otherwise specified):

<u>Parameter</u>	<u>Sources</u>	<u>Dropout / Trip</u>	<u>Pickup / Reset</u>
Undervoltage	N&E, 3 ϕ	70 to 98%	85 to 100%
Overvoltage	N&E, 3 ϕ	102 to 115%	2% below trip
Underfrequency	N&E	85 to 98%	90 to 100%
Overfrequency	N&E	102 to 110%	2% below trip
Voltage unbalance	N&E	5 to 20%	1% below dropout

- B. Repetitive accuracy of all settings shall be within $\pm 0.5\%$ over an operating temperature range of -20°C to 60°C .
- C. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.
- D. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).
- E. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation.
- F. The controller shall include a user selectable algorithm to prevent repeated transfer cycling to a source on an installation which experiences primary side, single phase failures on a Grounded Wye – Grounded Wye transformer which regenerates voltage when unloaded. The algorithm shall also inhibit retransfer to the normal (utility) source upon detection of a single phasing condition until a dedicated timer expires, the alternate source fails, or the normal source fails completely and is restored during this time delay period. The time delays associated with this feature shall be adjustable by the user through the controller keypad and LCD.

3.03 TIME DELAYS

- A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply.
- B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.
- C. Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.
- D. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.



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- E. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:
 - 1. Prior to transfer only.
 - 2. Prior to and after transfer.
 - 3. Normal to emergency only.
 - 4. Emergency to normal only.
 - 5. Normal to emergency and emergency to normal.
 - 6. All transfer conditions or only when both sources are available.
- F. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.
- G. All time delays shall be adjustable by using the LCD display and keypad or with a remote device connected to the serial communications port.

3.04 ADDITIONAL FEATURES

- A. A three position momentary-type test switch shall be provided for the *test / automatic / reset* modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal.
- B. A SPDT contact, rated 5 amps at 30 VDC, shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
- C. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.
- D. LED indicating lights (16 mm industrial grade, type 12) shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).
- E. LED indicating lights (16 mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.

The following features shall be built-in to the controller, but capable of being activated through keypad programming or the serial port only when required by the user:

- F. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before



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the generator is ready to accept the load.

- G. The controller shall be capable of accepting a normally open contact that will allow the transfer switch to function in a non-automatic mode using an external control device.
- H. Engine Exerciser - The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to:
 - 1. Enable or disable the routine.
 - 2. Enable or disable transfer of the load during routine.
 - 3. Set the start time, .
 - time of day
 - day of week
 - week of month (1st, 2nd, 3rd, 4th, alternate or every)
 - 4. Set the duration of the run.

At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. A 10-year life battery that supplies power to the real time clock in the event of a power loss will maintain all time and date information.

The following feature shall be built - into the controller, but capable of being activated through keypad programming or the communications interface port.

Note: The transfer switch will operate in a non-automatic mode with this feature activated.

- I. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or serial port.
- J. System Status - The controller LCD display shall include a "System Status" screen which shall be readily accessible from any point in the menu by depressing the "ESC" key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. For example,

Normal Failed
Load on Normal
TD Normal to Emerg
2min15s

Controllers that require multiple screens to determine system status or display "coded" system status messages, which must be explained by references in the operator's manual, are not permissible.

- K. Self Diagnostics - The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals



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to the controller which may be preventing load transfer commands from being completed..

- L. Data Logging – The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory: 1

1. Event Logging

1. Data and time and reason for transfer normal to emergency.
2. Data and time and reason for transfer emergency to normal.
3. Data and time and reason for engine start.
4. Data and time engine stopped.
5. Data and time emergency source available.
6. Data and time emergency source not available.

2. Statistical Data

1. Total number of transfers.
2. Total number of transfers due to source failure.
3. Total number of days controller is energized.
4. Total number of hours both normal and emergency sources are available.

PART 4 - ADDITIONAL REQUIREMENTS

4.01 WITHSTAND AND CLOSING RATINGS

- A. The withstand and closing ratings of the ATS, with any overcurrent device shall be 22,000 RMS symmetrical amperes minimum.
- B. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 0.025 and 0.05 second, time based ratings. ATSS which are not tested and labeled with time based ratings and have series, or specific breaker ratings only, are not acceptable.

4.02 TESTS AND CERTIFICATION

- A. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.
- B. The ATS manufacturer shall be certified to ISO 9001:2008 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001:2008

4.03 SERVICE REPRESENTATION

- A. The ATS manufacturer shall maintain a national service organization of company-



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employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.

- B. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

END OF SECTION