



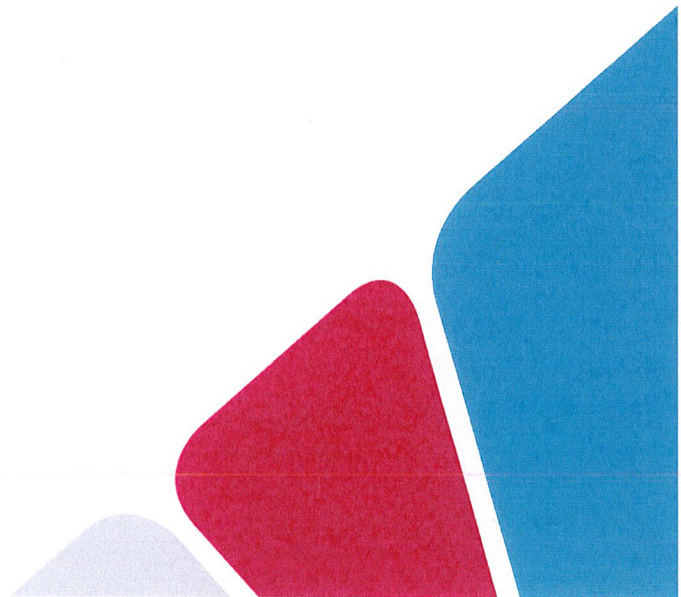
*Technical Specifications*

# City of Belle Glade BELLE GLADE AIRPORT LIFT STATION

*Prepared For:*  
The City of Belle Glade

*Prepared By:*  
Kimley-Horn and Associates, Inc.  
1920 Wekiva Way, Suite 200  
West Palm Beach, FL 33411  
CA 00000696

January 2021  
PROJECT NO. 144086023



**CITY OF BELLE GLADE**  
**BELLE GLADE AIRPORT LIFT STATION**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>TITLE</u></b>
-----------------------	---------------------

COVER

INDEX

**DIVISION 1 - GENERAL REQUIREMENTS**

01030	HURRICANE PREPAREDNESS
01050	FIELD ENGINEERING AND SURVEYING
01060	REGULATORY REQUIREMENTS AND NOTIFICATION
01090	REFERENCE STANDARDS
01150	MEASUREMENT AND PAYMENT
01152	APPLICATIONS FOR PAYMENT
01300	SUBMITTALS AND PROGRESS SCHEDULES
01410	TESTING LABORATORY SERVICES
01510	TEMPORARY UTILITIES
01560	TEMPORARY CONTROLS
01600	MATERIAL AND EQUIPMENT
01700	PROJECT CLOSEOUT
01720	PROJECT RECORD DRAWINGS
01730	OPERATION AND MAINTENANCE MANUALS

**DIVISION 2 - SITE WORK**

02016	EXISTING UTILITIES AND UNDERGROUND STRUCTURES
02065	DEMOLITION
02150	DEWATERING
02200	EARTHWORK, EXCAVATION, AND BACKFILL

02270	EROSION AND SEDIMENTATION CONTROL
02485	GRASSING
02510	PAVING AND SURFACING
02670	FLUSHING AND TESTING

### **DIVISION 3 - CONCRETE**

03100	CONCRETE FORMWORK
03200	CONCRETE REINFORCEMENT
03300	CAST-IN-PLACE CONCRETE
03400	STRUCTURAL PRECAST CONCRETE

### **DIVISION 4 - NOT USED**

### **DIVISION 5 - METALS**

05100	ACCESS HATCHES
05500	MISCELLANEOUS METALS

### **DIVISION 6-8 - NOT USED**

### **DIVISION 9 - FINISHES**

09900	PAINTING
09910	MANHOLE COATINGS

### **DIVISION 10 - NOT USED**

### **DIVISION 11 - EQUIPMENT**

11930	PUMPS – GENERAL
11931	SUBMERSIBLE WASTEWATER PUMPS

### **DIVISION 12 - NOT USED**

### **DIVISION 13 - SPECIAL CONSTRUCTION**

13441	INSTRUMENTATION COMPONENTS
-------	----------------------------

**DIVISION 14 - NOT USED**

**DIVISION 15 - PIPING AND VALVES**

15100 PIPING AND VALVES

**DIVISION 16 - ELECTRICAL**

16000 ELECTRICAL GENERAL REQUIREMENTS

16050 BASIC MATERIALS AND METHODS

16900 CONTROL PANELS

**DIVISION 17 - NOT USED**

**APPENDIX A GEOTECHNICAL ENGINEERING STUDY**

**APPENDIX B DEP/HEALTH DEPARTMENT STATE OF FLORIDA DOMESTIC  
WASTEWATER COLLECTION/TRANSMISSION INDIVIDUAL PERMIT**

**APPENDIX C PALM BEACH COUNTY LAND DEVELOPMENT DIVISION RIGHT-OF-WAY  
CONSTRUCTION UTILITY PERMIT**

**APPENDIX D PALM BEACH COUNTY WATER UTILITIES DEPARTMENT APPROVED  
PLANSET, UTILITY EASEMENT FORM, PRE-CONSTRUCTION MEETING  
CHECKLIST, AND PROJECT COMPLETION REQUIREMENTS**

This page left blank intentionally.

## SECTION 01030

### HURRICANE PREPAREDNESS

#### PART 1 -- GENERAL

##### 1.01 HURRICANE PREPAREDNESS PLAN

- A. The Contractor's attention is drawn to the possibility of hurricane or severe storm conditions occurring at the site of work during the course of Contract Work.
- B. Within fourteen (14) days of the date of the Notice to Proceed, the Contractor shall submit to the Engineer and City a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform at no additional cost to the City in case of a hurricane or severe weather warning.
- C. In the event of inclement weather, or whenever the City shall direct, the Contractor shall, and will, cause Subcontractors to protect carefully the Work and materials against damage or injury. Work and materials damaged due to inclement weather shall be removed and replaced at the expense of the Contractor.
  - 1. Hurricane Watch: Upon designation of a hurricane watch, the Contractor shall be responsible for storing all loose supplies and equipment on the job site that may pose a danger. In addition, the Contractor shall remove all bulkheads and plugs in pipelines that would impede drainage in the case of flooding. Structures that may be in danger of floatation shall be flooded. The Contractor shall also cooperate with the City in protecting any other structures at the site.
  - 2. Hurricane Warning: No mobile "temporary facility" under the control of or on the property of the City shall be staffed during a hurricane warning. Contractor facilities meeting these criteria shall be evacuated. Reasonable steps shall be taken to protect all such facilities and their contents from damage and to avoid the facility causing damage to the surroundings.

#### PART 2 – PRODUCTS

NOT USED.

#### PART 3 – EXECUTION

## SECTION 01050

### FIELD ENGINEERING AND SURVEYING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Provide and pay for field engineering and surveying services required for the project.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

##### 1.03 QUALIFICATIONS OF SURVEYOR

- A. Qualified Land Surveyor registered in the state of Florida with experience in construction field layout.

##### 1.04 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the project are those designated on the drawings.
- B. Contractor shall locate and protect survey control and reference points. Contractor shall provide additional benchmarks as required to construct the Project.
- C. Control datum for survey is that indicated on Drawings.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.
- G. Contractor shall not disturb existing monuments.

##### 1.06 PROJECT SURVEY REQUIREMENTS

- A. Establish lines, grades, and elevations by instrumentation or similar appropriate means utilizing recognized engineering survey practices.
- B. Horizontal alignment for the proposed construction will be controlled by right-of-way lines, property line, reference line, and existing structures. The Contractor shall be responsible to establish reference lines and necessary offsets to establish piping alignment and equipment and structure location. Contractor may make adjustments

to the horizontal and vertical alignment of proposed underground utilities to avoid conflicts upon approval by the Engineer.

- C. Vertical alignment for the proposed construction will be based on the existing grades and benchmark identified on the drawings. The Contractor shall be responsible to establish proposed grades. The grade stakes shall be provided by the Contractor.
- D. Establish a minimum of two permanent benchmarks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- E. Periodically verify layouts by same means.
- F. Prior to destruction of existing curb and pavement record existing grades to be used in reconstruction to assure proper flow of surface water runoff is maintained after restoration.
- G. Project record drawings for the water, storm, and sewer utilities shall be in accordance with the requirements set forth in the Palm Beach County Water Utilities Department Standards and these specifications.
- H. Utility Easements: Contractor will be required to hire the services of a surveyor to provide legal descriptions for the proposed utility easements shown on the drawings. The legal descriptions will need to be reviewed and approved by PBCWUD and recorded at the Palm Beach County Courthouse.

#### 1.07 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses to be submitted to the Engineer and City (City of Belle Glade) with close out documents.
- B. Submit partial record drawings as required to obtain a partial certification from the Palm Beach County Health Department for all phases of project construction.
- C. Submit a copy of the site drawing and certificate signed by land surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

#### 1.08 SUBMITTALS

- A. Submit name and address of Surveyor to Engineer and City.
- B. On request, submit copies of field notes and documentation verifying the accuracy of the survey work.

#### 1.09 EXAMINATION

- A. Contractor is responsible for verifying survey control points prior to initiation of work.

- B. Contractor shall promptly notify Engineer of any discrepancies discovered.

#### 1.10 QUALITY CONTROL

- A. Quality control of the Work shall be the Contractor's responsibility and Contractor shall make every effort to produce the best quality of work, as specified on the drawings and specifications.
- B. Twenty-four (24) hour notification to the Engineer by the Contractor shall be required for all specified field investigations unless otherwise noted.

#### PART 2 – PRODUCTS

Not used.

#### PART 3 – EXECUTION

Not used.

END OF SECTION

## SECTION 01060

### REGULATORY REQUIREMENTS AND NOTIFICATION

#### PART 1 – GENERAL

##### 1.01 GENERAL REQUIREMENTS

- A. Obtain and pay for all permits and licenses as required for construction of the project.
- B. Schedule all inspections and obtain all written approvals of the agencies required by the permits and licenses.
- C. Comply with all conditions specified in each of the permits and licenses.
- D. A copy of the permits obtained by the City will be furnished to the Contractor.

##### 1.02 PERMITS OBTAINED BY CITY

The City has obtained or is in the process of obtaining the following permits/approvals:

- A. Palm Beach County Water Utilities Department (PBCWUD) plan approval.
- B. Florida Department of Environmental Protection (FDEP) General Permit to Construct a Wastewater Collection / Distribution System.
- C. Palm Beach County Land Development Division Right-of-Way Construction Utility Permit

##### 1.03 PERMITS OBTAINED BY CONTRACTOR

- A. Contractor shall prepare, submit and obtain the building permit and sub-permits as necessary from the City of Belle Glade Building Department.
- B. The Contractor will be responsible for obtaining any required dewatering permits required for the execution of the work.
- C. The Contractor will be responsible for completing the MOT design and submitting to Palm Beach County Land Development for approval.

##### 1.04 NOTIFICATION

- A. The Contractor is required to notify the City and any applicable permitting agency who requires notification as part of their permit condition within the timeframe stated on the permit. If no time exists, notification shall be a minimum of 48 hours prior to initiating construction.

- B. Utility Companies: Contractor shall notify the Sunshine State One Call of Florida (SSOCF) service at 811, 2 working days prior to digging for direct bury and 10 days prior to digging or initiating construction of underwater construction activities, as required by Florida Statutes Chapter 556 throughout the duration of the construction project.
- C. The Contractor shall give the Engineer not less than seven (7) calendar days notice of the time and place (or places) where he will start the work.

#### 1.05 PERMIT CONDITIONS

- A. Contractor shall comply with and furnish all items necessary to satisfy any general or specific conditions that are a part of the City obtained permits.

#### PART 2 - PRODUCTS

Not used.

#### PART 3 - EXECUTION

Not used.

END OF SECTION

## SECTION 01090

### REFERENCE STANDARDS

#### PART 1 -- GENERAL

##### 1.01 REQUIREMENTS INCLUDED

Abbreviations and acronyms used in Contract Documents to identify reference standards.

##### 1.02 QUALITY ASSURANCE

- A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.
- B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.
- C. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- D. Conform to reference standard by date of issue current on bid date.
- E. Obtain copies of standards when required by the Contract Documents.
- F. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- G. Should specified reference standards conflict with Contract Documents, request clarification from the Engineer before proceeding.
- H. Neither the contractual relationship, duties, nor responsibilities of the parties in Contract nor those of the Engineer shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

##### 1.03 ABBREVIATIONS, NAMES, AND ADDRESSES OR ORGANIZATIONS

- A. Obtain copies of reference standards direct from publication source, when needed for proper performance of work, or when required for submittal by Contract Documents.
- B. The following, as appropriate to project, is a list of referenced standards and their mailing addresses for requesting copies of standards:

AA	Aluminum Association 818 Connecticut Avenue, NW Washington, D.C. 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, NW Washington, D.C. 20001
ACI	American Concrete Institute Box 19150 Redford Station Detroit, MI 48219
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AISC	American Institute of Steel Construction 1221 Avenue of the Americas New York, NY 10020
AISI	American Iron and Steel Institute 1000 16 <sup>th</sup> Street, NW Washington, D.C., 20036
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ASME	American Society of Mechanical Engineers 345 East 47 <sup>th</sup> Street New York, NY 10017
ASPA	American Sod Producers' Association Association Building Ninth and Minnesota Hastings, NE 68901
ASSE	American Society of Sanitary Engineers 960 Illuminating Building Cleveland, OH 44113
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103

AWS	American Welding Society 2501 NW 7 <sup>th</sup> Street Miami, FL 33125
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235
CDA	Copper Development Association 57 <sup>th</sup> Floor, Chrysler Building 405 Lexington Avenue New York, NY 10017
City	City of Belle Glade 110 Dr M.L.K. Jr Blvd W Belle Glade, FL 33430
County	Palm Beach County Water Utilities Department 8100 Forest Hill Blvd. West Palm Beach, FL 33413
CLFMI	Chain Link Fence Manufacturers Institute 1101 Connecticut Avenue Washington, D.C. 20036
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street, Suite 2110 Chicago, IL 60601
FDOT	Florida Department of Transportation Haydon Burns Building 605 Suwannee Street Tallahassee, FL 32301
FM	Factory Mutual System 1151 Boston-Providence Turnpike Norwood, MA 02062
NEMA	National Electrical Manufacturers Association 2101 L Street, NW Washington, D.C. 20037
NFPA	National Fire Protection Association 470 Atlantic Avenue Boston, MA 02210

NFPA	National Forest Products Association 1619 Massachusetts Avenue, NW Washington, D.C. 20036
NSF	National Sanitation Foundation NSF Building 3475 Plymouth Road Ann Arbor, MI 48106
NSWMA	National Solid Waste Management Association 1120 Connecticut Avenue, NW Washington, D.C. 20036
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 20076
PCI	Prestressed Concrete Institute 20 North Wacker Drive Chicago, IL 60606
PS	Product Standard U.S. Department of Commerce Washington, D.C. 20203
TCA	Technical Aid Series Construction Specifications Institute 1150 Seventeenth Street, NW Washington, D.C. 20036
UL	Underwriters Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062

PART 2 -- PRODUCTS

NOT USED

PART 3 -- EXECUTION

NOT USED

END OF SECTION

## SECTION 01150

### MEASUREMENT AND PAYMENT

#### PART 1 – GENERAL

##### 1.01 GENERAL

###### A. SCOPE OF THIS SECTION

1. The following explanation of the Measurement and Payment for the bid items is provided; however, the omission of reference to any item shall not alter the intent of the Bid Form or relieve the Contractor of the necessity of constructing a complete project under this Contract.
2. The quotations prepared by the Contractor for the various items of work are intended to establish a total price for completion of the work in its entirety. Should the contractor feel that the cost for any particular work item has not been established by the Schedule of Payment items or this section, the Contractor shall include the cost for that work in one of the bid items so the proposal for the project reflects the total cost to complete the work in its entirety.
3. The quantities set forth in the Bid Form are approximate and are given to establish a uniform basis for the comparison of bids. The City reserves the right to increase or decrease the quantity of any item or portion of the work during the progress of construction in accordance with the terms of the Contract. The Schedule of Values shall serve as a basis of developing additive or deductive Change Orders.
4. Unit prices are used as a means for computing the bid, for Contract purposes, for periodic payments, for determining value of additions or deletions.
5. Payment shall be made for the items listed on the Bid Form on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, tools, transportation, delivery, disposal of waste and surplus material, restoration and all other appurtenances to complete the construction and installation of the work as shown on the drawings and described in the specifications.

##### 1.02 SUBMITTALS

###### A. Informational:

1. Schedule of Values
2. Application for Payment
3. Final Application for Payment

###### B. Submittals shall be in accordance with Section 01300.

### 1.03 SCHEDULE OF VALUES

- A. Contractor shall prepare a schedule of values for review with the return of the executed agreement to the City. The schedule shall contain the installed value of the component parts of work for the purpose of making progress payments during the construction period.
- B. The schedule shall contain sufficient detail for proper identification of work accomplished. The sum of all scheduled items shall equal the total value of the contract.
- C. Unit Price Work: Reflect unit price quantity and price breakdown from the conformed bid form.
- D. Lump Sum Work:
  - 1. Reflect Schedule of Values
  - 2. List Bonds and Insurance, Mobilization, Demobilization, System Testing and Contract Closeout separately.
  - 3. Breakdown Divisions 2 through 17 with appropriate subdivision of each Specification.
- E. An unbalanced, front end loaded schedule will not be acceptable.

### 1.04 APPLICATION FOR PAYMENT

- A. Include accepted schedule of values for each portion of work and the unit price breakdown for the work to be paid on a unit price basis, and a listing of City selected equipment, if applicable, and allowances, as appropriate.
- B. Preparation:
  - 1. List each Change Order and Written Amendment executed prior to date of submission as a separate line item.
  - 2. Submit application for payment, a listing of materials on hand as applicable, and such supporting data as may be requested by the City/Engineer.

## PART 2 – PRODUCTS

### 2.01 BELLE GLADE AIRPORT LIFT STATION – ITEM DESCRIPTIONS

- A. MOBILIZATION / DEMOBILIZATION (Item No. 1)
  - 1. The work specified in this Section consists of 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, shop drawing submittals, record drawings, utility easement legal description and sketch, establishment of temporary provisions, field engineering and surveying, progress meeting attendance, adherence to the City's NPDES permit and Stormwater Pollution Prevention Plan (SWPPP) regulations and requirements, and adherence to state and local laws and regulations.

2. The items specified in this Section consist of the costs of any pre and post construction expenses necessary for the start and completion of the project, excluding the cost of construction materials. The sum of mobilization and demobilization shall not exceed 10% of the contract price. Partial Payments for mobilization shall be as follows:

Construction Percent Complete	Allowable Percent of Lump Sum for Mobilization
5%	25%
10%	50%
25%	75%
100%	100%

B. PERFORMANCE AND PAYMENT BONDS (Item No. 2)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis.
2. Basis of Payment: Payment for performance and payment bonds for the project will be based upon the lump sum price named for such work, in accordance with the requirements of the Contract Documents.

C. INSURANCE AND INDEMNIFICATION (Item No. 3)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis.
2. Basis of Payment: Payment shall be made at the Contract Lump Sum Price and shall include all compensation for insurance and indemnification in accordance with the Contract documents.

D. MAINTENANCE OF TRAFFIC (Item No. 4)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis. The Contractor's lump sum price shall include full compensation for all work related to the maintenance of traffic during the construction of the improvements shown on the plans, and any other related work.
2. Basis of Payment: Payment shall be made at the percentage of the item is complete and accepted by the City. Contract Lump Sum Price shall include, but not be limited to, furnishing all materials, labor, and equipment required to install, maintain, and remove any and all required traffic control measures to control the flow of traffic through the work area within the public rights of way. Preparation and submittal of any Maintenance of Traffic (MOT) plans to the City and any required agencies as well as coordination with these parties shall also be included in this item. All work shall be in accordance with applicable local, state, and federal requirements.

E. DEMOLITION (Item No. 5)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis.
2. Basis of Payment: Payment shall be at the Contract Lump Sum Price and shall include, but not be limited to, furnishing all materials, labor, and equipment required to demolish/remove the muck/unsuitable soils, wastewater drain piping, septic tanks, asphalt, and all ancillary components as shown on the plans to allow construction of the new improvements. Debris removal, hauling and legal off-site disposal of debris shall also be included in this item.

F. CIVIL/MECHANICAL IMPROVEMENTS (Item No. 6)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis.
2. Basis of Payment: Payment shall be at the Contract Lump Sum Price and shall include, but not be limited to, furnishing all necessary equipment, labor, and materials required to remove surface materials and all protruding objects, excavation of any type of material including rock, trench safety, dewatering, installation of new PVC gravity sewer and connections, installation of a new precast manhole structure, installation of a new water service, installation of a new valve vault with access hatch and coatings, wetwell with access hatch and coatings, installation of the lift station pumps as shown on the plans including rails, piping, fittings, valves, air release valve, instruments, pipe supports, control floats, connection to existing force main, testing, and start-up, and any other items required for a complete and functional system.

G. ELECTRICAL IMPROVEMENTS (Item No. 7)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis.
2. Basis of Payment: Payment shall be at the Contract Lump Sum Price and shall include, but not limited to, furnishing, installing all the labor, equipment and materials required to install all electrical and control system components, equipment, panels, wiring, conduits, connections, level sensors, float switches, programming, testing and any other items required for a complete and functional system. This payment item shall also include all coordination, construction, and initial connection fees for new electrical and telco service. Direct fees from ATT and FPL shall be paid for by the contractor and reimbursed from the Allowance For Unforeseen Conditions Bid Item.

H. SITE RESTORATION (Item No. 8)

1. Method of Measurement: The quantity to be paid for under this Section shall be on a lump sum basis.

2. Basis of Payment: Payment shall be at the Contract Lump Sum Price and shall include, but not limited to, furnishing, installing all the labor, equipment and materials required to restore the project area to an equal or better condition than what was existing prior to the start of the project or work within a particular area, including asphalt trench repair, sod, irrigation repairs, debris removal, painting, landscaping, or any other restoration and/or clean up required for a complete and functional system.

## 2.03 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

Payment will not be made for the following:

- A. Loading, Hauling, and disposing of rejected materials.
- B. Quantities of materials wasted or disposed of in a manner not called for on the contract documents.
- C. Rejected loads of material, including material rejected after it has been installed by reason of the Contractor failing to conform to the Contract Documents.
- D. Material not unloaded from a transporting vehicle.
- E. Defective Work not accepted by the City.
- F. Materials remaining on hand after completion of the work.

END OF SECTION

This page left blank intentionally.

## SECTION 01152

### APPLICATIONS FOR PAYMENT

#### PART 1 -- GENERAL

##### 1.01 REQUIREMENTS INCLUDED

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

##### 1.02 RELATED REQUIREMENTS

A. In other parts of the Construction Documents:

1. Agreement between Owner and Contractor
2. General Conditions of the Contract
3. Payments to Contractor and Completion

B. Specified in Other Sections:

1. Section 01010: Summary of Work
2. Section 01700: Project Closeout

##### 1.03 FORMAT AND DATA REQUIRED

A. Submit itemized applications typed in a format approved by Engineer. All applications for payment must be numbered, dated, and signed by the Contractor.

B. Provide itemized data on payment application (format, schedules, line items and values accepted by Engineer).

##### 1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.
2. Fill in summary of dollar values.
3. Execute certification with the signature of a responsible officer of the contract firm.
4. Have resident project representative review and sign application prior to submission to Engineer.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:
  - 1. Project
  - 2. Application number and date
  - 3. Detailed list of enclosures
  - 4. For stored products:
    - a. Item number and identification
    - b. Description of specific material
- B. Submit one copy of data and cover letter for each copy of application.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. Application for payment is required for progress payments
- B. Only one application will be acceptable in any one month

1.07 SUBMITTAL PROCEDURE

- A. Submit Applications for Payment to Engineer at the time stipulated in the Agreement.
- B. Number: Four copies of each progress Application.
- C. When Engineer finds the Application properly completed and correct, he will transmit the applications for payment to the Owner.
- D. Amount of Retainage shall be 10% unless otherwise stated in the Agreement or supplementary conditions between Owner and Contractor.

PART 2 -- PRODUCTS

Not applicable

PART 3 -- EXECUTION

Not applicable

END OF SECTION

## SECTION 01300

### SUBMITTALS AND PROGRESS SCHEDULES

#### PART 1 — GENERAL

##### 1.01 WORK INCLUDED

- A. Submit, to the Engineer, shop drawings, estimated construction progress schedule, project data and samples required by specification sections.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

##### 1.03 SCHEDULES

- A. Prepare and submit to the City and Engineer at the first pre-construction meeting estimated construction progress schedules for the work, including a separate schedule listing dates for submission and dates reviewed shop drawings, project data and samples will be needed for each product.

##### 1.04 FORM OF SCHEDULES

- A. Prepare schedules in suitable format with dated schedule printout. A horizontal bar chart should be used as additional illustration and for revised progress schedules.
  - 1. Horizontal time scale: Identify the first work day of each week.

##### 1.05 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
  - 1. Show the complete sequence of construction.
  - 2. Show the dates for the beginning, and completion of, each major element of construction.
  - 3. Show projected percentage of completion for each item, as of the first day of each month.
- B. Submittals Schedule for Shop Drawings, Product Date and Samples. Show:
  - 1. The dates for Contractor's submittals.

##### 1.06 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission of schedule.
- B. Show changes occurring since previous submission of schedule.

- C. Provide a narrative report as needed to define:
  - 1. Problem areas, anticipated delays, and the impact on the schedule.
  - 2. Corrective action recommended, and its effect.

#### 1.07 SUBMISSIONS

- A. Submit initial schedules within 7 days after award of Contract.
  - 1. Engineer will review schedules with City and return review copy within 5 days after receipt.
  - 2. If required, resubmit within 2 days after return of review copy.
- B. Submit revised progress schedules with each application for payment when there are major revisions in progress schedules.

#### 1.08 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
  - 1. Job site file.
  - 2. Subcontractors.
  - 3. Other concerned parties.
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

### PART 2 — PRODUCTS

#### 2.01 SHOP DRAWINGS

- A. Original drawings or product data, prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate portions of the Work; showing fabrication, layout, material data, setting or erection details, installation drawings, construction drawings, certified and interconnecting wiring diagrams, etc. The Contractor shall be responsible for securing all information, details, dimensions, drawings, etc. necessary to prepare submission drawings required and necessary under this Contract and to fulfill all the requirements of this Contract. Submittals are anticipated to include, but not be limited to, the following:
  - 1. Detailed schedule and phasing plan
  - 2. MOT Plan (vehicular and pedestrian)
  - 3. Dewatering Plan
  - 4. Concrete mix designs (with specific locations), grouts, etc.
  - 5. Precast concrete structures
  - 6. FRP Structure
  - 7. Hatches
  - 8. Electrical equipment and wiring
  - 9. Pumps
  - 10. Odor control equipment
  - 11. Control floats

12. Pump rails & float hanger
13. Valves and appurtenances
14. Piping and fittings and appurtenances
15. Fencing
16. Asphalt and base materials
17. Instrumentation
18. Paintings, coatings, liners, etc.

- B. Fabrication Drawings are to be prepared by a qualified detailer.
- C. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

## 2.02 PROJECT DATA

- A. Manufacturer's standard schematic drawings
  1. Modify drawings to delete information which is not applicable to project.
  2. Supplement standard information to provide additional information application to project.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
  1. Clearly mark each copy to identify pertinent materials, products or models.
  2. Show dimensions and clearances required.
  3. Show performance characteristics and capacities.
  4. Show wiring diagrams and controls.

## 2.03 SAMPLES

- A. Contractor shall furnish for review all samples as required by the Contract Documents or as requested by the City.
- B. Samples shall be of sufficient size and/or quantity to clearly illustrate the quality, type, range of color, finish or texture and shall be properly labeled to show the nature of the Work where the material represented by the sample will be used.

## 2.04 WARRANTIES

- A. Original Warranties, called for in the Contract Documents, shall be submitted to the City. When warranties are required, they shall be submitted prior to request for payment.

## 2.05 SCHEDULE OF VALUES

- A. The Contractor shall submit a separate schedule of values for those items in the proposal that are to be paid under a lump sum basis. The schedule shall contain the installed value of the component parts of the work for the purpose of making progress payments during the construction period and the preparation of change orders.

- B. The schedule shall be given in sufficient detail for the proper identification of the Work accomplished. Each item shall include its proportional share of all costs including the Contractor's overhead, contingencies, and profit. The sum of all schedule items shall equal the total sum of the Contract.
- C. The Contractor shall expand or modify the above schedule and materials listing as required by the City's initial or subsequent reviews of the schedule of values.

## 2.05 PAY REQUESTS

- A. Pay Requests shall be made in accordance with the requirements of the Agreement between City and Contractor.
- B. Amount of Retainage shall be 10% until such time when the value of the work completed equals 50% of the contract value. Then the retainage amount will be reduced to 5% through final completion of the project.

## PART 3 — EXECUTION

### 3.01 CONTRACTOR RESPONSIBILITIES

- A. Review Shop Drawings, Project Data and Samples prior to submission.
- B. Verify:
  - 1. Field measurements.
  - 2. Field construction criteria.
  - 3. Catalog numbers and similar data.
- C. Coordinate each submittal with requirements of Work and the Contract Documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.
- E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.
- F. Notify Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- G. Begin no work which requires submittals until return of submittals with Engineer's stamp and initials or signature indicating review.
- H. After Engineer's review, distribute copies.

### 3.02 SUBMISSION REQUIREMENTS

- A. Schedule submissions at least 14 days before dates reviewed submittals will be needed.

- B. Submit number of copies of Shop Drawings, Project Datum and Samples which Contractor requires for distribution plus 1 copy which will be retained by Engineer.
- C. Accompany submittals with transmittal letter, in duplicate, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. Contractor's name and address.
  - 4. Notification of deviations from Contract Documents.
  - 5. Other pertinent data.
- D. Submittals must include:
  - 1. Date of submittal and revision dates.
  - 2. Project title and number.
  - 3. The names of:
    - a. Engineer.
    - b. Contractor.
    - c. Subcontractor.
    - d. Supplier.
    - e. Manufacturer.
    - f. Separate detailer when pertinent.
  - 4. Identification of product or material.
  - 5. Relation to adjacent structure or materials.
  - 6. Field dimensions, clearly identified as such.
  - 7. Identification of deviations from Contract Documents.
  - 8. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.

### 3.03 RESUBMISSION REQUIREMENTS

- A. Shop Drawings.
  - 1. Revise initial drawings as required and resubmit as specified for initial submittal.
  - 2. Indicate on drawings any changes which have been made other than those requested by Engineer.

### 3.04 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute copies of Shop Drawings and Project Datum which carry Engineer's stamp, to:
  - 1. Contractor's file.
  - 2. Job site file.
  - 3. Record Documents file.
  - 4. Other prime contractors.
  - 5. Subcontractors.
  - 6. Supplier.
  - 7. Fabricator.

END OF SECTION

## SECTION 01410

### TESTING LABORATORY SERVICES

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Contractor shall employ and pay for services of an Independent Testing Laboratory to perform specified services.
- B. Inspection, Sampling and Testing is required for:
  - 1. Densities and proctors (for soil compaction)
  - 2. Asphalt and sub-base testing as required
  - 3. Cast-in-place Concrete (slump and compressive strength)
  - 4. Other operations specified in these specifications.
- C. Contractor's employment of Testing Laboratory shall in no way relieve Contractor of their obligation to perform Work in accordance with Contract.

##### 1.02 QUALIFICATION OF LABORATORY

- A. Meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories.
- B. Meet basic requirements of ASTM E 329-90 "Standard Practice for Use in the Evaluation of Testing Agencies for Concrete and Steel as Used in Construction".
- C. Certified in the State of Florida in accordance with FDEP requirements.

##### 1.03 LABORATORY DUTIES; LIMITATIONS OF AUTHORITY

- A. Cooperate with Engineer and Contractor; provide qualified personnel promptly on notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
  - 1. Comply with specified standards; ASTM, other recognized authorities, and as specified.
  - 2. Ascertain compliance with requirements of Contract Documents.
- C. Promptly notify Engineer, and Contractor, of irregularities or deficiencies of Work which are observed during performance of services.
- D. Promptly submit 2 copies of reports of inspections and tests to Engineer, including:
  - 1. Date issued.
  - 2. Project title and number.

3. Testing Laboratory name and address.
4. Name of Inspector
5. Date of inspection or sampling.
6. Record of temperature and weather.
7. Date of test.
8. Identification of product and specification section.
9. Location in project.
10. Type of inspection or test.
11. Observations regarding compliance with Contract Documents.

E. Laboratory is not authorized to:

1. Release, revoke, alter, or enlarge on, requirements of Contract Documents.
2. Approve or accept any portion of Work.
3. Perform any duties of the Contractor.

#### 1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Select laboratory, and coordinate testing with Lab and Engineer's representative.
- B. Cooperate with Laboratory personnel, provide access to Work.
- C. Provide to Laboratory, preliminary representative samples of materials to be tested, in required quantities.
- D. Furnish copies of mill test reports.
- E. Furnish casual labor and facilities:
  1. To provide access to Work to be tested.
  2. To obtain and handle samples at the site.
  3. To facilitate inspections and tests.
  4. For Laboratory's exclusive use for storage and curing of test samples.
- F. Notify Laboratory sufficiently in advance of operations to allow for his assignment of personnel and scheduling of tests.
- G. Pay for services of the Testing Laboratory to perform inspections, sampling and testing required in these specifications and:
  1. For Contractor's convenience.
  2. When initial tests indicate Work does not comply with Contract Documents.

Such payment shall be made directly by the Contractor.

- H. Contractor will be responsible for payment for all failing tests.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

This page intentionally left blank

SECTION 01510  
TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Furnish, install, and maintain temporary utilities required for construction; remove on completion of entire project.
- B. Provide temperature, ventilation, and lighting requirements, if applicable, as specified in each individual section.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01010: Summary of Work

1.03 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with National Electric Code.
- B. Comply with federal, state, and local codes and regulations, and with utility company requirements.

PART 2 – PRODUCTS

2.01 MATERIALS (GENERAL)

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

2.02 TEMPORARY ELECTRICITY AND LIGHTING

- A. The Contractor must maintain power to all existing buildings and areas.
- B. The Contractor is responsible for providing and paying for all power required for his operations.
- C. Contractor is responsible for arranging power for his office trailers(s), power tools, etc., at his own expense. The Contractor shall pay the costs of all power used.
- D. Provide POWER CENTERS for miscellaneous tools and equipment used in the work:

1. Weatherproof distribution box with minimum of four 20-amp., 120-volt grounded outlets.
  2. Locate so that power is available at any point of use with minimum 100-foot CONSTRUCTION-TYPE power cords.
  3. Provide circuit breaker protection for each outlet.
- E. Provide adequate artificial lighting for all areas of work, when natural light is not adequate for work, and for areas accessible to persons other than Contractor's employees. Night work shall not be allowed unless specifically approved by the City.
- F. If Contractor requires service other than specified above, he shall arrange for, provide maintenance, and pay all costs incurred.

#### 2.03 TEMPORARY WATER

Contractor shall make arrangements with Palm Beach County Water Utilities Department to obtain hydrant meter(s) for all temporary water at the project site. Contractor shall pay for all temporary water required for his operations.

#### 2.04 TEMPORARY SANITARY FACILITIES

- A. Contractor shall provide temporary sanitary facilities in compliance with laws and regulations.
- B. Contractor shall provide for regular service, cleaning, and maintenance of temporary facilities and enclosures.
- C. Sanitary facilities shall be screened from the public view in accordance with applicable City of Belle Glade regulations.

### PART 3 – EXECUTION

#### 3.01 GENERAL

- A. Comply with applicable requirements specified herein.
- B. Maintain and operate systems to ensure continuous service.

#### 3.02 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.
- C. Restore existing facilities used for temporary services to specified, or to original, condition.

END OF SECTION

## SECTION 01560

### TEMPORARY CONTROLS

#### PART 1 - GENERAL

##### 1.01 REQUIREMENTS INCLUDED

- A. Furnish, install, and maintain temporary control facilities required for construction; remove on completion of entire project any features not intended to remain on the project site.
- B. Provide noise control, dust control, water control, debris control, pollution control and erosion control as specified in the appropriate sections of these documents.

##### 1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

##### 1.03 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with federal, state, and local codes and regulations and utility company requirements.
- B. Contractor is required to prepare, submit and obtain all permits listed to be obtained by the contractor in Section 01060 – Regulatory Requirements and Notification.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS (GENERAL)

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

##### 2.02 TEMPORARY NOISE CONTROL

- A. Mechanical equipment shall be fitted with mufflers to reduce noise from internal combustion type engines.
- B. Bells, sirens, alarms, etc., shall be adjusted to provide adequate warnings to personnel on the project site; however, they shall be regulated to an intensity that is amenable to the neighboring communities.
- C. Exterior construction work noises shall be kept to a minimum during evening, night, and early morning hours. In addition, weekend and holiday noises shall be limited to acceptable levels.

- D. In addition to on-site control, noise considerations shall be made to off-site vehicles and equipment (mobilization, demobilization, deliveries, etc.).

#### 2.03 TEMPORARY DUST CONTROL

- A. Dust formed as a result of the construction shall be controlled by the Contractor. Cleaning of work areas and application of dust control materials are the most effective methods of dust control.

#### 2.04 TEMPORARY WATER CONTROL

- A. The flow of water through the construction site shall be controlled by the Contractor such that it does not damage any constructed items; however, it shall be diverted and channeled to effectively leave the site as soon as possible. Puddling and ponding on the site is not permitted.
- B. Water shall be controlled such that it does not enter excavated areas, nor is deposited on or against constructed features.

#### 2.05 TEMPORARY DEBRIS CONTROL

- A. Provision shall be made by each Contractor to have available adequate containers to hold any and all debris that is to be generated from the project. Containers should be covered to prevent wind blowing paper, plastic, and lightweight products around and off the site.
- B. Provide acceptable containers for deposit of debris and waste. Instructions shall be given to personnel to utilize the trash containers. Containers shall be placed in convenient places at the site.
- C. At least once per week, a thorough cleaning of trash and debris shall be made at the construction site. An acceptable method of disposal shall be employed.
- D. Maintain all areas under the Contractor's control free of extraneous debris, garbage and waste matter.
- E. Initiate and maintain a specific program to prevent accumulation of debris at the construction site, storage and parking areas, or along access roads and haul routes.
- F. Prohibit overloading of trucks to prevent spillage on access and haul roads.
- G. Provide periodic inspection of traffic areas to enforce requirements.

#### 2.06 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or air by the discharge of noxious substances from construction operations.
- B. Immediately remove and properly dispose of all contaminated materials upon discovery of spillage of noxious substances

- C. Take special precautions to prevent harmful substances from entering public waters.
- D. Provide systems for control of atmospheric pollutants and prevent toxic concentrations of chemicals.

## PART 3 – EXECUTION

### 3.00 GENERAL

- A. Comply with all applicable requirements of local building codes.
- B. Maintain and operate systems to assure continuous service.
- C. Modify and extend systems as work progress requires.
- D. Preserve from damage all property along the line of work or which is in the vicinity of or is in any way affected by the Work. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the City.

### 3.01 INSPECTIONS

- A. Prior to placing temporary facilities into service, inspect and test each service and arrange for inspections and tests by governing authorities and obtain required certifications and permits for use thereof.

### 3.02 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.
- C. Restore permanent facilities used for temporary services to specified conditions.

END OF SECTION

## SECTION 01600

### MATERIAL AND EQUIPMENT

#### A. TRANSPORTATION AND HANDLING

Deliver manufactured materials and products to the project site as needed for installation, undamaged, in original packages, containers, or bundles, as packaged by the manufacturer with manufacturer's name, brand, seals, and labels intact. Materials other than those designated within the Specifications shall not be delivered to the project site.

#### B. STORAGE AND PROTECTION

1. Protect and preserve all materials until final acceptance of the Project. Store all materials in a manner to facilitate inspection and to prevent damage, contamination, intermixing, or theft.
2. Miscellaneous metal, reinforcement bars, welded wire fabric, and masonry reinforcement materials shall be stored to prevent contact with the ground and from being damaged by its own weight or by other loads. Reinforcement which has become muddy shall be cleaned before use.
3. Store cementitious materials in weathertight sheds on elevated floors away from damp surfaces.
4. Do not use and dispose of materials that have been stored for longer than their maximum recommended shelf life or beyond their recommended shelf date.
5. Store and protect all material and equipment in accordance with manufacturer's recommendations.

#### C. PROTECTION OF EQUIPMENT

1. Keep products clean by elevating above ground or floor and by using suitable coverings. Take such precautions as are necessary to protect apparatus and materials from damage. Failure to protect materials is sufficient cause for rejection of the apparatus or material in question.
2. Protect factory finish from damage during construction operations and until acceptance of the project. Satisfactorily restore any finishes that become stained or damaged.

END OF SECTION

This page intentionally left blank

## SECTION 01700

### PROJECT CLOSE-OUT

#### PART 1 – GENERAL

##### 1.01 REQUIREMENTS INCLUDED

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Comply with requirements stated in General and Special Conditions of the Contract and in Specifications for administrative procedures in closing out the work.

##### 1.02 SUBSTANTIAL COMPLETION

- A. When Contractor considers his work is substantially complete, he shall submit to Engineer:
  - 1. A written notice that the work, or designated portion thereof, is substantially complete.
  - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, Engineer will perform an inspection to determine the status of completion.
- C. Should Engineer determine that the work is not substantially complete:
  - 1. Engineer will promptly notify the Contractor, in writing, giving the reasons.
  - 2. Contractor shall remedy the deficiencies in the work, and shall send a second written notice of substantial completion to Engineer
  - 3. Engineer will re-inspect the work
- D. When Engineer concurs that the work is substantially complete, he will:
  - 1. Prepare a Certificate of Substantial Completion, accompanied by a list of items to be completed or corrected
  - 2. Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the certificate.

##### 1.03 FINAL INSPECTION

- A. When Contractor considers the work is complete, he shall submit written certification that:
  - 1. Contract Documents have been reviewed
  - 2. Work has been inspected for compliance with Contract Documents
  - 3. Work has been completed in accordance with Contract Documents

4. Equipment and systems have been tested in the presence of the Owner's representative and are operational
  5. Equipment and systems instructions to Owner's personnel have been completed.
  6. Work is completed and ready for final inspection
- B. Engineer will perform an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should Engineer consider that the work is incomplete or defective:
1. Engineer will promptly notify the Contractor, in writing, listing the incomplete or defective work.
  2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to Engineer that the work is complete.
  3. Engineer will re-inspect the work.
- D. When Engineer finds that the work is acceptable under the Contract Documents, he shall request the Contractor to make closeout submittals.

#### 1.04 RE-INSPECTION FEES

Should the Engineer perform re-inspection due to failure of the work to comply with the claims of status of completion made by the Contractor, Contractor will compensate Engineer/Owner for such additional services.

#### 1.05 ADDITIONAL SERVICES

Should Engineer be required to provide representation at the site for the administration of the Contract for Construction, more than thirty days after the specified Date of Substantial Completion of the work, Contractor will compensate Engineer for such additional services.

#### 1.06 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

- A. Evidence of compliance with requirements of governing authorities.
- B. Project Record Documents: To requirements of Section 01720 and the general conditions of the Contract Documents.
- C. Warranties and Bonds: See Item G below
- D. Spare Parts and Operation and Maintenance Materials: To requirements of each specification section
- E. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions
- F. Certificate of Insurance for Products and Completed Operations

- G. One (1) Year Maintenance Warranty
- H. Applicable Warranties from material and equipment manufacturers

#### 1.07 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to Owner.
- B. Statement shall reflect all adjustments to the Contract Sum:
  - 1. The original Contract Sum
  - 2. Additions and deductions resulting from:
    - a. Previous change orders
    - b. Unit prices
    - c. Deductions for liquidated damages
    - d. Other adjustments
  - 3. Total Contract sum, as adjusted
  - 4. Previous payments
  - 5. Sum remaining due
- C. Owner will prepare a final change order, reflecting approved adjustments to the Contract sum which were not previously made by change order.

#### 1.08 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

#### PART 2 – PRODUCTS

NOT USED.

#### PART 3 – EXECUTION

NOT USED.

END OF SECTION

This page intentionally left blank

## SECTION 01720

### PROJECT RECORD DRAWINGS

#### PART 1 – GENERAL

##### 1.01 PROJECT RECORD DOCUMENTS

- A. Maintain at the site for the City one record copy of:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other Modifications to the Contract.
  - 5. Engineer Field Orders or written instructions.
  - 6. Reviewed Shop Drawings.
  - 7. Field test records.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01700 – Project closeout
- C. Palm Beach County Water Utilities Department (PBCWUD) Standards

##### 1.03 MAINTENANCE OF DOCUMENTS

- A. Store documents in approved location apart from documents used for construction.
- B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- C. Make documents available at all times for inspection by Engineer and City. Record drawing information shall be maintained concurrently with Pay Requests.

##### 1.04 MARKING DEVICES

- A. Provide ink marking pens for recording information in a color code.

##### 1.05 RECORDING

- A. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress.
  - 1. Do not conceal any work until required information is recorded.

C. Drawings shall be drawn to record actual construction:

1. Horizontal location of pipes and other improvements shall be provided any time the pipe passes a permanent surface reference point. Horizontal locations shall be provided in State Plane, NAD 83, format consistent with PBCWUD requirements. Permanent surface reference points must be permanent structures manholes, catch basins, concrete sidewalk or concrete curbs. Edge of pavement and road intersections may not be used without the Engineer's approval. Any deviations from the alignment shown on the drawings must be noted.

Vertical location of piping shall be provided at fittings, tie-ins, structure inverts, and 25 foot intervals.

All fittings, including sleeves and valves shall be located vertically and horizontally by two measurements to permanent surface reference points.

Record drawings shall conform with the requirements set forth in the general and supplemental conditions of the Contract.

Water Utility Record Drawings shall conform with the requirements of the PBCWUD Requirements.

2. Existing utilities that are not shown on the plans that are found in the field are to be noted and recorded on the record drawings. Actual locations of all utilities shall be noted and recorded on the record drawings.
3. Field changes of dimension and detail.
4. Drainage and Control Structure rim, invert, and weir elevations.
5. Changes made by Field Order or by Change Order.
6. Details not on original Contract Drawings.

D. Specifications and Addenda; legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each item actually installed.
2. Changes made by Field Order or by Change Order.

1.06 SUBMITTAL

A. At Contract Close-out, Record Documents shall be submitted to Engineer in the following formats for City:

1. Three bound sets of 24" x 36".
2. Three bound sets of 11"x17".
3. One CD or memory stick with drawings in AutoCAD Release 2018.

B. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

## PART 2 – PRODUCTS

Not used.

## PART 3 – EXECUTION

Not used.

END OF SECTION

This page intentionally left blank

## SECTION 01730

### OPERATION AND MAINTENANCE MANUALS

#### PART 1 – GENERAL

##### 1.01 RELATED INFORMATION

- A. Compile product data and related information appropriate for City's maintenance and operation of products furnished under the Contract.
  - 1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.
- B. Instruct City's personnel in the maintenance of products and in the operation of equipment and systems.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01300 - Submittals
- C. Section 01720 - Project Record Drawings

##### 1.03 FORM OF SUBMITTALS

- A. Prepare data in the form of an instructional manual and electronic format for use by City's personnel.
- B. Hard-Copy Format:
  - 1. Size: 8-1/2 in. x 11 in.
  - 2. Text: Manufacturer's printed data, or neatly typewritten.
  - 3. Drawings:
    - a. Provide reinforced punch binder tab, bind in with text.
    - b. Fold larger drawings to the size of the text pages.
  - 4. Provide fly-leaf for each separate product, or each piece of operating equipment.
    - a. Provide typed description of product, and major component parts of equipment.
  - 5. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
    - a. Title of Project.

- b. Identity of separate structure as applicable.
- c. Identity of general subject matter covered in the manual.

C. Binders:

- 1. Commercial quality expandable catalog binders with durable and cleanable plastic covers.
- 2. When multiple binders are used, correlate the data into related consistent groupings.

#### 1.04 CONTENT OF MANUAL

A. Neatly typewritten table of contents for each volume, arranged in a systematic order.

- 1. Contractor, name of responsible principal, address and telephone number.
- 2. A list of each product required to be included, indexed to the content of the volume.
- 3. List, with each product, the name, address and telephone number of:
  - a. Subcontractor or installer.
  - b. Maintenance contractor, as appropriate.
  - c. Identify the area of responsibility of each.
  - d. Local source of supply for parts and replacement.
- 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

B. Product Data:

- 1. Include only those sheets which are pertinent to the specific product.
- 2. Annotate each sheet to:
  - a. Clearly identify the specific product or part installed.
  - b. Clearly identify the data applicable to the installation.
  - c. Delete references to inapplicable information.

C. Drawings:

- 1. Supplement product data with drawings as necessary to clearly illustrate relations of component parts of equipment and systems.

2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
  3. Do not use Project Record Documents as maintenance drawings.
- D. Written text, as required to supplement product data for the particular installation:
1. Organize in a consistent format under separate headings for different procedures.
  2. Provide a logical sequence of instructions for each procedure.
- E. Copy of each warranty issued.
1. Provide information sheet for City's personnel, give:
    - a. Proper procedures in the event of failure.
    - b. Instances which might affect the validity of warranties.

#### 1.05 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit three (3) complete hard copies and one electronic copy (Adobe Acrobat .pdf format on CD or memory stick) of manual in final form.
- B. Content, for each unit of equipment and system, as appropriate:
1. Description of unit and component parts.
    - a. Function, normal operating characteristics, and limiting conditions.
    - b. Performance curves, engineering data and tests.
    - c. Complete nomenclature and commercial number of all replaceable parts.
  2. Operating procedures:
    - a. Start-up, break-in, routine and normal operating instructions.
    - b. Regulation, control, stopping, shut-down and emergency instructions.
    - c. Summer and winter operating instructions.
    - d. Alignment, adjusting and checking.
  3. Servicing and lubrication schedule:
    - a. List of lubricants required for each piece of equipment.

- b. Schedule for manufacturer recommended maintenance.
- 4. Manufacturer's printed operating and maintenance instructions.
- 5. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
- 6. Provide master list of all equipment warranties with their respective expiration dates, manufacturer's authorized service dealer, parts distributor addresses, and phone numbers.
- 7. Other data as required under pertinent sections of specifications.

#### 1.06 SUBMITTAL SCHEDULE

- A. Submit one copy of completed data in final form fifteen days prior to final inspection or acceptance.
  - 1. Copy will be returned after final inspection or acceptance, with comments.
- B. Submit specified number of copies of approved data in final form 10 days after final inspection or acceptance.

#### 1.07 INSTRUCTION OF CITY'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct City's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment and systems.
- B. Operating and maintenance manual shall constitute the basis of instruction.
  - 1. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

#### PART 2 – PRODUCTS

NOT USED.

#### PART 3 – EXECUTION

NOT USED.

END OF SECTION

## SECTION 02016

### EXISTING UTILITIES AND UNDERGROUND STRUCTURES

#### PART 1 – GENERAL

##### 1.01 GENERAL

- A. The plans depict the approximate location of the known existing utilities. The locations of those facilities (horizontal and vertical) were obtained from survey information, Utility Atlas and Record Drawings provided by the applicable Utility Owners, and utility soft dig information.
- B. Existing utilities shown are located according to the information available to the engineer at the time of the topographic survey(s). Guarantee is not made that all existing underground utilities are shown or that the location of those shown are entirely accurate. Finding the actual location of any existing utilities is the contractor's responsibility and shall be done before he commences and work in the vicinity. Furthermore, the contractor shall be fully responsible for any and all damages due to the contractor's failure to exactly locate and preserve any and all underground utilities.

##### 1.02 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor shall notify the Sunshine State One Call of Florida (SSOCF) service at 811, 2 full working days prior to digging for direct bury and 10 days prior to digging or initiating construction of underwater construction activities, as required by Florida Statutes Chapter 556 throughout the duration of the construction project.
- B. Locate the cables, ducts, conduit, pipeline, etc. in advance of the proposed construction.
- C. Notify Engineer of any substantial changes and/or conflicts that would require a deviation in the plans. Late discovery of existing underground utilities does not constitute "required" deviations should early discovery prevent them.
- D. Repair any damage done to existing utilities at no additional expense to the Owner.
- E. Remove or modify those utilities scheduled to be removed or modified on the plans.
- F. All Asbestos cement pipe that is not abandoned in place shall be removed and disposed of off-site in a legal manner and in a manner to prevent the pipe from becoming friable.

END OF SECTION

## SECTION 02065

### DEMOLITION

#### PART 1 - GENERAL

##### 1.01 SCOPE OF WORK

- A. The Contractor shall furnish all supervised labor, materials, equipment, and incidentals required for the removal of wastewater drain piping and fittings, septic tanks, asphalt, etc.
- B. The Contractor shall furnish all supervised labor, materials, equipment, and incidentals required for the miscellaneous structural, mechanical, and electrical demolition as shown on the plans.

Removal procedures are as outlined below:

- 1. Complete or partially remove and dispose of specified existing piping, mechanical equipment, electrical components/equipment, and miscellaneous appurtenances encountered during construction operations.
- 2. Temporarily modify structures, equipment, appurtenances and utilities as necessary to allow for operation of the facilities during construction.
- 3. Demolish, remove and cut existing concrete and masonry structures as required for the new construction.
- 4. Handle existing equipment to be reinstalled or salvaged as specified. Any existing equipment or material which is removed or replaced as a result of construction under this project may be designated as salvageable by the City of Belle Glade and if so, shall be removed, cleaned, and delivered to a protected location specified by the City. Any equipment or material not worthy of salvaging, as directed by the City, shall be disposed of in a legal manner by the Contractor at an off-site location. Upon request of the Engineer, Contractor shall submit evidence of proper disposal.
- 5. Arrange for off-site disposal of excess and unacceptable materials including but not limited to concrete, concrete blocks, bricks, steel, PVC, fuel, etc. All materials are to be disposed of in a legal manner.
- 6. This section may not cover all of the activities necessary to perform the work. The Contractor shall exercise due concern for the utility system operation and shall diligently direct all of the Contractor's activities toward maintaining continuous operation of the existing facilities and minimizing operation impacts.
- 7. The general sequence of demolition is described in Section 01010, Work Sequence.

## 1.02 RULES AND REGULATIONS

- A. The Building Code of the State of Florida shall control the demolition, modification or alteration of the existing site.
- B. No blasting shall be done on site.
- C. Refer to the City of Belle Glade and the project permits for additional requirements.

## 1.03 ACCESS

- A. Conduct demolition and modification operations, and the removal of equipment and debris to ensure minimum interference with roads and walks both on-site and off-site and to ensure minimum interference with occupied or used facilities.
- B. Special attention is directed towards maintaining safe and convenient access to the existing facilities.
- C. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the City. Provide alternate routes around closed or obstructed traffic in access ways.

## 1.04 PROTECTION

- A. The Contractor shall conduct construction activities to minimize damage to adjacent buildings, structures, roadways, utilities, storm drainage, and other facilities, including persons.

## 1.05 DAMAGE

- A. The Contractor shall immediately report damage caused to adjacent facilities by demolition operations. The Contractor shall promptly make all required repairs as directed by the Engineer and at no cost to the City.

## 1.06 UTILITIES

- A. It shall be the Contractor's responsibility to maintain existing utilities in service and protect against damage during demolition operations.

## 1.07 POLLUTION CONTROL

- A. For pollution control, use sprinkling, temporary enclosures, and other suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air to the lowest level of air pollution practical for the conditions of work. Comply with the governing regulations.
- B. Clean adjacent structures and improvements of all dust, dirt, and debris caused by demolition operations. Return areas to conditions existing prior to the start of work.

#### 1.08 SUBMITTALS

- A. Provide a detailed sequence of demolition and removal work as part of the Contractor's schedule.

#### 1.09 CONDITION OF STRUCTURES

- A. The City and the Engineer assume no responsibility for the actual condition of the structures to be modified.
- B. By submitting a bid, the Contractor affirms that the Contractor has carefully examined the site and all conditions affecting the Work. Conditions existing at the time of inspection for bidding purposes will be maintained by the City insofar as practical

#### PART 2 – PRODUCTS

NOT USED.

#### PART 3 – EXECUTION

NOT USED.

END OF SECTION

## SECTION 02150

### DEWATERING

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

The work covered by this Section consists of furnishing all permits, labor, equipment, appliance and materials, and performing all operations required for dewatering all excavations, if required, complete.

##### 1.02 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 02200 – Earthwork, Excavation, and Backfill.

#### PART 2 - PRODUCTS

##### 2.01 TEMPORARY FACILITIES

- A. All materials and equipment shall be suitable and adequate to function continuously as a dewatering system.
- B. All material and equipment used in the dewatering system remain the property of the Contractor and shall be removed off-site when dewatering is completed.
- C. All dewatering equipment shall conform with the noise standards set forth in the City of Belle Glade Code of Ordinances.

##### 2.02 SUBMITTALS

- A. Submit the dewatering method or plan in accordance with Submittal specifications prior to commencing dewatering if it is determined by the Contractor that dewatering beyond that allowed by a no-notice dewatering permit is required to construct the project.
- B. The Contractor shall prepare and submit the necessary permit applications and supporting documents for the purposes of obtaining a dewatering permit from the South Florida Water Management District and any other required agencies.

#### PART 3 - EXECUTION

##### 3.01 METHODS

- A. The method of dewatering is to be selected by the Contractor and may include:

1. Wellpoints
2. Sump pumps
3. Bedding rock
4. Dewatering wells
5. Other approved items.

### 3.02 DISCHARGE

- A. The Contractor shall provide all labor, materials, tools and equipment necessary to properly control the quality of the discharge from his dewatering operations as described herein. The Contractor shall comply with all applicable laws, rules and regulations governing the discharge of water from his dewatering operations.
- B. Contractor shall not discharge water in any manner that will:
  1. Adversely affect water quality of nearby water bodies.
  2. Violate Federal, State or local laws or regulations.
  3. Allow discharge to flow onto private property.
  4. Hamper movement of traffic.
  5. Damage portions of the work previously constructed.
  6. Damage portions of existing facilities or structures.
  7. Violate the conditions of the SFWMD Dewatering Permit.
  8. Violate the conditions of the Stormwater Pollution Prevention Plan.
- C. Contractor shall obtain and pay for any permits required to discharge the dewatering waters.
- D. Contractor shall coordinate and pay for any water quality monitoring program that may be required by the applicable dewatering permit(s).

END OF SECTION

## SECTION 02200

### EARTHWORK, EXCAVATION, AND BACKFILL

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

The work covered by this section consists of furnishing all labor, equipment, and materials, and performing all earthwork operations to include:

- A. Excavation and backfill of conduits and pavements.
- B. Surface preparation for conduits and pavements.
- C. Excavation and backfill of pipe trenches.
- D. Roadway area grading.
- E. Soil compaction and stabilization requirements for pipe trenches and roadway areas.
- F. Soil testing for pipe trenches and parking areas.

##### 1.02 REFERENCES

- A. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
- B. American Society for Testing and Materials (ASTM)
  - D698 Moisture-Density Relationship of Soils.
  - D1556 Standard Method of Test for Density of Soil in Place by Sand Cone Method.
  - D1557 Method for Test for Moisture-Density Relations of Soils Using a 10-Pound Rammer and 18-Inch Drop.
  - D2487 Classification of Soils for Engineering Purposes.
  - D6938 Standard Test Method for In-place Density and Water content of Soil and soil-aggregate by Nuclear Methods (shallow depth)

##### 1.03 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01410 - Testing Laboratory Services

- C. Section 02016 - Existing Utilities and Underground Structures
- D. Section 02150 – Dewatering
- E. Section 02510 – Paving and Surfacing
- F. Palm Beach County Right of Way Standards

#### 1.04 FIELD MEASUREMENTS AND COORDINATION

- A. Verify that survey benchmark, control point, and intended elevations for the work are as shown on the Drawings.
- B. Verify that work associated with lower elevation utilities is complete before placing higher elevation utilities.

#### 1.05 SUBSURFACE SOILS DATA

- A. City and Engineer make no representations or statements as to site or soil conditions, and therefore do not assume any responsibility for actual site or soil conditions. It shall be Contractor's responsibility to determine for himself existing site and/or soil conditions.

### PART 2 - PRODUCTS

#### 2.01 EXCAVATION

- A. All excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

#### 2.02 SOURCE QUALITY CONTROL

- A. If tests for a material type fail three times, the Engineer may reject the source supplier and require the contractor to submit a new source for approval, at no additional cost to the City. The in-situ material is considered acceptable material and may be used, provided it meets the specified requirements.
- B. Quality control of the work shall be the Contractor's responsibility and Contractor shall make every effort to produce the best quality work as specified on the Drawings and in these Specifications.

#### 2.03 STRUCTURAL FILL AND BACKFILL

- A. Fill and backfill under and around all structures shall be suitable on-site excavated material or approved imported material. Material shall be free of organic material, shall not have more than 10 percent by dry weight passing the U.S. Standard No. 200 sieve, and shall have no rocks larger than 3 inches in size. On-site Fine Sand (SP), without roots or other deleterious materials, is suitable material. Imported material may be provided by the Contractor at no additional cost to the City.

- B. On site soils with more than 10% by dry weight passing the U.S. Standard No. 200 sieve and/or particle sizes larger than 3 inches are not suitable for use as fill under pavements or structures.
- C. Backfill behind walls shall be as specified above except that they shall not have more than 4% by dry weight passing the U.S. Standard No. 200 sieve.

#### 2.04 EARTHFILL

- A. On-site excavated material free from roots, trash, and rocks larger than 3 inches.

#### 2.05 WATER FOR COMPACTION

- A. Contractor shall furnish potable water, as required. Contractor may coordinate with the Palm Beach County Water Utility Department to arrange for a hydrant meter for water during construction. Costs associated with the hydrant meter shall be paid for by the Contractor. Water trucks shall be used as required.

#### 2.06 EQUIPMENT

- A. All equipment shall be suitable and adequate to perform the work specified. Compaction equipment shall be non-vibratory, static type. It is recommended that the contractor perform a preconstruction assessment of existing adjacent structures and monitor those structures for settlement during the construction period. Contractor shall notify City of any settlements that occur at existing adjacent structures.

### PART 3 – EXECUTION

#### 3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum locations. Protect bench marks, survey control points, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- B. Locate, identify, and protect utilities that remain from damage.

#### 3.02 STRIPPING TOPSOIL

- A. Stripping of topsoil shall be performed prior to any cutting, excavation, removal and/or replacement or fill materials.
- B. Strip topsoil from entire site within boundaries of proposed construction lines to a depth of approximately 6". The top materials stripped shall be removed and disposed of off site, unless authorized for use on the site by the Engineer or City. Top materials shall not be used under roadway or parking areas unless approved by the Engineer or City.

- C. Stripping of topsoil shall ensure that entire site is stripped and scraped clean of all brush, weeds, grass, roots, vegetation, etc.

### 3.03 CUTTING

- A. Except as otherwise specified, after stripping of topsoil all site areas which are above elevation required shall be cut to subgrades required by drawings.

### 3.04 FILLING

- A. Except as otherwise specified, after stripping of topsoil all site areas which are below elevation required shall be compacted as specified and then over such areas clean granular fill placed and compacted in layers not exceeding 12" in uncompacted thickness. Each layer of fill shall be compacted to at least 95% of the modified proctor maximum dry density (ASTM D1557). If hand held compaction equipment is used, the lift thickness should be reduced to 6 inches. Filling and compaction shall continue until subgrades required for various areas are reached. All holes and depressions caused from removal of trees, stumps, etc. shall be filled and compacted. Fill shall be good clean material as previously specified.

### 3.05 EXCAVATION UNDER STRUCTURES AND PAVEMENT AREAS

- A. Excavation shall be performed to elevations and dimensions required by drawings with suitable allowance made for construction operations and inspections. Excavation carried to depths below required elevations shall be replaced in loose layers a maximum of 6" in depth and compacted in a manner to achieve a minimum density of 98% as determined by a modified proctor in accordance with ASTM D-1557. Contractor may place additional concrete in lieu of replacing and compacting excess excavation as specified above to fill excess cut. Correction of excess cut shall be responsibility of Contractor at no additional cost to City.
- B. Compact disturbed load bearing soil in direct contact with foundations to achieve a minimum density of 98% as determined by a modified proctor in accordance with ASTM D-1557.
- C. Verify that the specified density extends to 12 inches below the bottom of the structure or pavement base course to be installed.
- D. Slope banks with machine to angle of repose or provide necessary shoring.
- E. Do not interfere with 45 degree bearing splay of existing foundations without providing adequate means of shoring protection.
- F. Grade top perimeter of excavating to prevent surface water from draining into excavation.
- G. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

- H. Correct areas over excavated in accordance with this section.
- I. Remove excavated material unsuitable for backfill from site.
- J. When muck or other deleterious materials is encountered in the excavation, it shall be completely removed within the area of the structure or pavement and to a depth where acceptable material is encountered. After removal of all muck or other deleterious material, the area shall be backfilled with approved fill material to the specified grade.

### 3.06 TRENCH EXCAVATION AND PREPARATION

- A. Excavation: Excavate as required for the installation of all piping, utilities, conduits, and appurtenances.
- B. Trench Width: Cut trenches sufficiently wide to enable installation, compaction and inspection. The maximum width will not be limited except where excessive trench width would cause damage to adjacent structures or piping.
- C. Grade: Excavate the bottom of the trench to the line and grade shown, or as established by the Engineer with proper allowance for pipe bedding.
- D. All trench work shall comply with the Trench Safety Act of 1990, with latest revisions.
- E. Piping shall be installed in a dry trench.
- F. When acceptable material is encountered in the trench, the bottom shall be excavated and graded to the depth required so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground at every point between bell holes.
- G. Bell holes shall be provided at each joint to permit the joint to be made properly. At no time shall the bells support the pipe when in the trench.
- H. When muck or other deleterious materials is encountered in the trench, it shall be completely removed for the width of the trench at the pipe and to a depth where acceptable material is encountered. After removal of all muck or other deleterious material, the trench shall be backfilled with bedding material to the bottom of pipe grade.
- I. See City and PBCWUD Standards for additional requirements.

### 3.07 MAINTENANCE OF EXCAVATION

- A. The excavation shall be maintained at a dry condition at all times.
- B. All side slopes shall be such that material will not slide into the bottom of the excavation and any material doing so shall be immediately removed. Trench side slopes shall be in accordance with local codes, OSHA requirements, and the Trench Safety Act.

- C. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed.
- D. Trees, shrubbery, fences, poles, bollards and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the Engineer.

### 3.08 BACKFILL UNDER STRUCTURES AND PAVEMENT AREAS

- A. Backfilling of excavated areas under, around or over building and structural appurtenances and pavement, concrete or pavers shall be performed with clean fill materials which are free of debris, organics, trash or other deleterious substances. Suitable compaction equipment shall be used to obtain density described previously for entire depth of backfilling. Each layer of backfill under structures, pavements, and pavers shall be compacted to a minimum of 98% density as determined by a modified proctor in accordance with ASTM D-1557. Each layer of compacted backfill shall not exceed 12 inches in thickness. If hand-held compaction equipment is used, reduce the loose lift thickness to 6 inches. The completed, compacted surface shall be at the proper final subgrade elevation.
- B. Verify that the specified density extends to 12 inches below the bottom of the structure or pavement base course to be installed.

### 3.10 TRENCH BACKFILLING

- A. Haunch Backfill: Carefully place Pipe Bedding material so as not to damage the pipe in maximum 6 inch loose lifts and compact to the pipe centerline. Use hand-held compaction equipment.
- B. Pipe Zone: Backfill with Pipe Bedding material in maximum 6 inch loose lifts and compact to a point 12 inches above the pipe crown.
- C. Under Pavement/Concrete/Paver Areas, and Structures: In areas where backfill settlement must be held to a minimum, backfill above the pipe zone with Pipe bedding material in maximum 6 inch loose lifts and compact to a minimum 98 percent maximum dry density (ASTM D1557) up to the subgrade elevation.
- D. Outside Pavement/Concrete/Paver Areas: In areas where backfill settlement is not critical, backfill above the pipe zone with earthfill material to a density equal to or greater than the soil adjacent to the pipe trench, but not less than 95 percent of the maximum dry density (ASTM D1557), to final grade.
- E. No material shall be used for backfill which contains muck or other deleterious material or material with an excessive void content. All backfill shall be composed of select clean granular material.

- F. All trenches and excavation shall be backfilled immediately after all pipe and joints have been investigated and approved by the Engineer or Utility Department, subject to satisfactory pressure and leakage test results, as required.
- G. Backfill, in general, shall be kept up with the rate of pipe laying. No more than 200 feet of pipe trench shall be open at one time at any one project location.
- H. See City and PBCWUD Standards for additional requirements.

### 3.11 BACKFILL AROUND STRUCTURES:

- A. Obtain Engineer's acceptance of concrete work and attained concrete strength prior to backfilling.
- B. Backfill with Structural Backfill material placed in maximum 12 inch loose lifts and compacted to a minimum 98 percent of maximum dry density (ASTM D 1557).
- C. Compact backfill adjacent to structures with equipment that will not damage the structure.
- D. Backfill with flowable fill or other material shall be used only if reviewed and approved by the Engineer.

### 3.12 SITE GRADING

- A. Fill and contour site areas with earth fill material to elevations shown and as required to prepare the site for landscape grading and sodding.
- B. Place materials in maximum 12 inch loose lifts and compact as required to limit subsequent settlement.

### 3.13 COMPACTION TESTING

- A. In-situ compaction testing shall be performed by a certified laboratory.
- B. Compaction testing shall be done by nuclear density equipment or other approved methods. (ASTM D-2937, D-1557, D-6938)
- C. Density testing shall be performed as follows:
  - 1. Pipe/Conduit Trenches: 1 test per lift per 400 feet of pipe.
  - 2. Fill Under/Around Structures: 1 test per lift under each structure or 1 backfill test per lift per structure/transformer pad installed.
  - 3. Fill Under Pavement Areas: 1 test per lift per 1,000 square feet of compacted surface area. Alternate lanes in roadway for test locations.
- D. Test results in a specific location are only representative of a larger area if the contractor has used consistent compaction means and methods and the soils are practically uniform throughout. If it is determined by the City/Engineer that there are

variations in the compaction methods and/or soil uniformity, additional testing may be required.

### 3.14 FINAL AND FINISH GRADING

- A. Using clean topsoil, perform all final and finish grading in all yard and planting areas indicated on drawings. Topsoil shall be placed to a minimum of 4" thickness, rototilled to a minimum depth of 8", leveled and finish graded in all areas. No pavement base course material or broken asphalt will be allowed as topsoil materials in landscaping areas.
- B. Final grading shall be performed and grades shaped to finished elevations indicated. Finish grades (top of the soil) shall be approximately 1-1/2" below edges of pathways, curbs and other paved or concrete slabs. After sod installation, the top of the sod shall not be more than 1/2" below or shall be flush with the grade established by any adjacent paved or curbed surface.
- C. The Contractor shall verify that all finish subgrades are correct prior to beginning installation of sod and planting materials. Upon completion of the project work, the Contractor shall prepare "record drawings" verifying that all finish grades are in accordance with the contract documents and shall submit same to the Engineer for review and acceptance prior to requesting final inspection of the project. The "record drawings" shall be prepared by a surveyor registered in the State of Florida.
- D. Upon project completion, all areas of site within immediate construction and adjacent areas shall be completely cleaned of all debris occasioned by this construction of this construction. Particular attention is called to any cement, mortar, masonry drippings and plaster which shall be completely removed from planting and lawn areas and shall be disposed of off site.
- E. All areas adjacent to site and all areas not within contract construction areas shall be left in reasonably same condition as they were found prior to commencement of construction.
- F. Any damage to the existing adjacent facilities including adjacent lakes or roads, and related areas such as, but not limited to, finish grades, slopes, grass sod, structures, pipe, etc. shall be repaired and restored to a proper and appropriate condition acceptable to the City and Engineer.

### 3.15 EXCESS MATERIAL

- A. Remove all excess suitable material from the site and dispose of at Contractor's expense.
- B. Unsuitable materials shall also be removed and disposed of off-site at Contractor's expense.

END OF SECTION

## SECTION 02270

### EROSION AND SEDIMENTATION CONTROL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

The work specified in this Section consists of measures required to control erosion on the project and in areas outside the project area where work is accomplished in conjunction with the project, so as to prevent pollution of water, detrimental effects of public or private property adjacent to the project area and damage to work on the project. These measures will consist of construction and maintenance of temporary erosion control features or, where practical, the construction and maintenance of permanent erosion control features.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.
- B. Section 01060 – Regulatory Requirements

##### 1.03 START OF WORK

Do not start work until erosion control measures are in place.

#### PART 2 - PRODUCTS

##### 2.01 GENERAL

- A. No testing of materials used in construction of temporary erosion control features will be required.
- B. Materials used for the construction of the temporary erosion and sedimentation control measures not to be incorporated into the completed project may be new or used.

#### PART 3 - EXECUTION

##### 3.01 GENERAL

- A. Construct temporary and permanent erosion and sediment control measures to prevent the pollution of adjacent water ways in conformance with the laws, rules and regulations of Federal, State and local agencies.
- B. Temporary erosion control features shall consist of, but are not be limited to, temporary grassing, temporary sodding, temporary mulching, spoil containment pits, sandbagging, slope drains, sediment basins, artificial coverings, berms, baled hay or straw, floating silt barriers, staked silt barriers and staked silt fences. Design details for some of these items may be found in the Chapter 6 of the Florida Land

Development Manual: A Guide to Sound Land Water Management (Department of Environmental Regulation, 1988) or the Water Quality Section of the applicable edition of the FDOT Roadway and Traffic Design Standards.

- C. Incorporate permanent erosion control features into the project within seven (7) days of any construction activity. Correct conditions, using temporary measures, that develop during construction to control erosion prior to the time it is practical to construct permanent control features.
- D. The Contractor will be required to prepare, submit, and obtain a Notice of Intent (NOI) to use Generic Permit for Stormwater Discharge from the Florida Department of Environmental Protection which will include a Stormwater Pollution Prevention Plan (SWPPP) prepared by the Contractor as required by F.A.C. 62-621.300(4) and the Environmental Protection Agency (EPA) as part of the National Pollutant Discharge Elimination System (NPDES) prior to beginning work.

### 3.02 INSTALLATION

- A. Baled Hay or Straw:
  - 1. This work shall consist of construction of baled hay or straw dams to protect against downstream accumulations of silt. The baled hay or straw dams shall be constructed in accordance with the details shown in FDOT's Roadway and Traffic Design Standards.
  - 2. The dam shall be placed so as to effectively control silt dispersion under conditions present on this project. Alternate solutions and usage of materials may be used if approved.
- B. Temporary Silt Fences and Staked Silt Barriers: This work shall consist of furnishing, installing, maintaining and removing staked turbidity barriers in accordance with the manufacturer's directions, these specifications, conditions of the project permits, and the details as shown in FDOT's Roadway and Traffic Design Standards. Turbidity barriers shall be installed and maintained in all locations where suspended solids may be transferred to the Intracoastal Waterway due to the project including pile installation. Turbidity barriers shall remain in place until construction is completed, soils are stabilized, and vegetation has been established.

### 3.03 REMOVAL OF TEMPORARY EROSION CONTROL FEATURES

In general, remove or incorporate into the soil any temporary erosion control features existing at the time of construction of the permanent erosion control features in such a manner that there will be no detrimental effect.

### 3.04 MAINTENANCE OF EROSION CONTROL FEATURES

- A. General: Provide routine maintenance of permanent and temporary erosion control features until the project is completed and accepted.

- B. Maintenance of erosion control measures shall be in strict accordance with condition of the applicable FDEP, NPDES, and City of Belle Glade requirements.

### 3.05 PROTECTION DURING SUSPENSION OF CONTRACT TIME

In the event that it is necessary that the construction operations be suspended for any appreciable length of time, shape the top of the earthwork in such a manner as to permit runoff of rainwater and construct earth berms along the top edges of embankments to intercept runoff water. Provide temporary slope drains to carry runoff from cuts and embankments which are located in the vicinity of the Intracoastal Waterway. Should such preventive measures fail, immediately take such other action as necessary to effectively prevent erosion and siltation.

END OF SECTION

## SECTION 02485

### GRASSING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

The Contractor shall furnish all labor, equipment, and materials necessary for grassing all areas disturbed by his operations and any other areas on the plans indicated to receive grassing. It is the intent of this specification that damaged areas are to be replaced in kind, with sod to be used for all maintained yard areas. Contractor shall take all steps practical to minimize the area required to be sodded. All grassing shall be in accordance with Section 570 of the current FDOT Standard Specifications for Road and Bridge Construction, except as modified herein.

##### 1.02 STORAGE OF MATERIALS

The Contractor shall provide space for storage of sod prior to placement in a manner that will not endanger or restrict pedestrian or vehicular traffic or interfere with other aspects of the work.

##### 1.03 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

#### PART 2 - PRODUCTS

##### 2.01 SOD

- A. Types: Sod shall be St. Augustine Floratam, Argentine Bahia, Centipede, or Bermuda, depending on type of existing sod in adjacent area to be matched. Sod shall be well matted with roots. Where sodding will adjoin, or be in sufficiently close proximity to private lawns, types of sod other than those listed above may be used if desired by the affected property Citys and approved by the Engineer. Sod shall be delivered in commercial-size rectangles, preferably 12-inch by 24-inch or larger.
- B. Condition: The sod shall be sufficiently thick to secure a dense stand of live grass. The sod shall be live, fresh, and uninjured at the time of planting. It shall have a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. It shall be reasonably free of weeds and other grasses. It shall be planted as soon as possible after being dug and shall be kept moist from the time it is planted.

##### 2.02 GRASSING EQUIPMENT

- A. Rollers: A cultipacker, traffic roller, or other suitable equipment will be required for rolling the grassed areas.

## PART 3 - EXECUTION

### 3.01 GENERAL CONSTRUCTION METHODS

No grassing shall be done when the ground is unduly wet or otherwise not in a suitable condition. Whenever a suitable length of right-of-way, disturbed area, or other area has been graded, it shall be made ready, when directed by the City/Engineer, and grassed in accordance with these specifications. Grassing shall be incorporated into the project at the earliest practical time in the life of the contract.

### 3.02 SODDING

- A. Preparation of Area to be Sodded: The ground which is to receive sod shall have been graded to proper elevations (2" below sodded grade) to match pre-construction conditions or proposed grades. All disturbed swales and ditches shall have been restored to their pre-construction condition or better. The pre-construction grade shall be maintained, and the prepared soil shall be loose and reasonably smooth. It shall be reasonably free of large clods, roots, patches of existing grass, and other material which will interfere with the sod-laying operations or subsequent mowing and maintenance operations.
- B. Laying of Sod: Sod shall be installed in all areas so designated by City/Engineer. Sod shall be carefully placed so that each piece abuts flush to all surrounding sod, regardless of whether surrounding sod is new or existing. All sod joints shall be staggered. Where new sod is to be placed adjacent to existing sod, the new sod must be cut in to match the elevation of the existing sod. Uneven sod which might cause mowing problems will be rejected. New sod laid on top of existing sod will also be rejected. All sod placed on steep slopes (greater than 1:1) shall be pinned with a wooden pin to keep it in place.
- C. Rolling: Immediately after completion of the sod laying, the entire sodded area shall be rolled thoroughly with the equipment specified. At least two trips over the entire area will be required.
- D. Watering: Newly-sodded areas are to be watered by Contractor as necessary to keep sod alive until the Contractor is closed out. Dead sod shall be replaced by Contractor prior to contract closeout.

END OF SECTION

## SECTION 02510

### PAVING AND SURFACING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

The work covered by this section of the Specifications consists of furnishing all labor, materials, equipment and supplies and performing all operations for the construction of pavements under this Contract.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.
- B. Section 01410 - Testing Laboratory Services
- C. Section 02200 – Earthwork, Excavation and Backfill
- D. Section 02514 – Milling of Existing Asphalt Pavement
- E. Section 02580 – Pavement Markings

##### 1.03 REFERENCED SPECIFICATIONS

- A. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition. Referred to in this section as DOT Std. Specs.

##### 1.04 SUBMITTALS

- A. Submit name of all material sources to the Engineer. Provide materials from the same approved source throughout the project. All material sources shall be Florida DOT approved.
- B. Submit proposed job-mix design to the Engineer for review.
- C. Submit written certifications that each material conforms to these specifications.

#### PART 2 - PRODUCTS

##### 2.01 BASE MATERIAL

- A. Limerock material shall meet the requirements of Section 911 of the FDOT specifications.
- B. Crushed Concrete may be used upon review and approval by the Engineer. Crushed Concrete shall meet the Sections 204-2.2.2 and 204-2.2.3 of the FDOT requirements for Reclaimed Concrete Aggregate Base Materials. Crushed concrete is not approved for use in FDOT Right of Way.

- C. Contractor to bid and use only one base material throughout the project outside of the right-of-way. Contractor can reuse existing base to the greatest extent practical if it is found to be suitable as a base material.
- D. Non-Excavatable flowable fill may only be used as base course after review and approval by the Engineer.

## 2.02 PRIME AND TACK COATS

The materials used for prime and tack coats shall meet the requirements of Section 300 of the DOT Std. Specs.

## 2.03 ASPHALTIC CONCRETE

Type S-III Asphaltic Concrete shall be used within City of Belle Glade right of way and shall meet the requirements of the City Standards. Pavement types called for in the Palm Beach County right of way shall meet the requirements of the Palm Beach County Std. Specs. and as specified in the Palm Beach County Land Development Utility Right-of-way permit issued for the project. Type S-III asphaltic concrete may only be used outside the County and FDOT right of way.

## 2.04 EQUIPMENT

All equipment associated with the operations of pavement placement and related work shall be entirely suitable for the applicable operations performed and shall be maintained in good condition.

## 2.05 QUALITY CONTROL

- A. Quality control of the work shall be the Contractor's responsibility and said Contractor shall make every effort to produce the best quality work as specified on the Plans and in these Specifications.
- B. Density tests on the compacted subgrade and base shall be performed by an independent testing laboratory at locations designated by the Engineer.

# PART 3 - EXECUTION

## 3.01 EXAMINATION

- A. Verify underground utilities are completed and inspected.
- B. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.

## 3.02 SUBGRADE AND SHOULDER STABILIZATION (TYPE C)

- A. The pavement subgrade and roadway shoulders shall be prepared, graded, stabilized and compacted to the lines and grades as shown on the Plans in

accordance with Type C Stabilization in Section 160 of the DOT Std. Specs. Both shoulder and subgrade to provide minimum 75 lb. Florida Bearing Value or a minimum limerock bearing ratio of 40. Subgrade shall be compacted to not less than 98 percent of the maximum dry density as determined by the modified proctor test (ASTM D1557).

### 3.03 BASE

- A. Base shall be prepared, graded and compacted to the lines and grades as shown on the Plans. Base shall be compacted to not less than 98 percent of the maximum dry density as determined by the modified proctor test (ASTM D1557).

### 3.04 PRIME AND TACK COAT

- A. Base shall receive a prime coat with cover material in accordance with Section 300 of the DOT Std. Specs.
- B. Pavement overlays shall receive a tack coat in accordance with Section 300 of the DOT Std. Specs.

### 3.05 ASPHALTIC CONCRETE SURFACE COURSE

- A. Asphaltic concrete surface course shall be constructed to a minimum thickness as specified on the Plans and be placed in a minimum of two (2) lifts.
- B. Asphaltic concrete surface course shall be constructed in accordance with Sections 320 and 330 of the DOT Std. Specifications.
- C. All existing exposed edges which abut to new Asphaltic Concrete Surface Course shall be saw cut in a straight and neat appearing line.
- D. All asphaltic concrete surface course pavement replacement shall be placed by mechanical spreading and screeding equipment as specified in Article 330-5.2.3 of the DOT Std. Specifications unless otherwise indicated. This will require at least an 8 ft. width for surface course placement unless specialty equipment is used which has received prior approval of the Engineer.

### 3.06 FIELD QUALITY CONTROL

- A. Section 01410 - Testing Laboratory Services: Contractor to provide field inspection and testing for compaction densities.

### 3.07 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury until surface temperature is less than 140 degrees F (60 degrees C).

END OF SECTION

## SECTION 02670

### FLUSHING AND TESTING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Flushing and Pressure Testing of systems including, but not limited to, the sanitary forcemains shown to be installed on the Plans.
- B. Contractor shall furnish all necessary pumps, hoses, piping, fittings, meters, gauges, and labor to conduct specified testing.
- C. Testing shall be repeated at the Contractor's expense until satisfactory results are achieved.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

##### 1.03 SUBMITTALS

- A. Test Reports: Indicate results comparative to specified requirements. Submit two (2) copies of test results to Engineer in accordance with Submittal specifications.

##### 1.04 REGULATORY REQUIREMENTS

- A. Conform to applicable Florida DEP requirements for performing the work of this Section.

#### PART 2 - NOT USED

#### PART 3 - EXECUTION

##### 3.01 EXAMINATION

- A. Verify that pumps and piping systems have been cleaned, inspected, and tested.

##### 3.02 FLUSHING AND PRESSURE TESTING - PIPING

The Contractor shall furnish and install suitable temporary testing plugs or caps for the pipelines, 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 pipelines. Flushing and pressure testing shall be conducted in the following order.

- A. After all pipelines 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 or cannon flushing. Contractor shall furnish and install required pig launch and exit assemblies or temporary piping required for cannon flushing. Non-abrasive pigs shall be employed. Flushed water may be discharged to the onsite catch basins or water bodies and be coordinated with City. Contractor to provide means of discharging water to catch basins or water bodies at Contractor's expense.
- B. Pressure testing piping systems:
1. The test pressure for the water piping shall be 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 onsite 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 judgement 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 Town Public Works Department. In any event, the Contractor shall be responsible for the ultimate water tightness of the plant piping within the preceding requirements.

END OF SECTION

SECTION 03100  
CONCRETE FORMWORK

PART 1 — GENERAL

1.01 WORK INCLUDED

- A. Formwork for cast-in place concrete, with shoring, bracing, and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.02 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Section 03200 - Concrete Reinforcement
- B. Section 03300 - Cast-in-Place Concrete

1.03 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ACI 347 - Recommended Practice for Concrete Formwork.
- D. PS 1 - Construction and Industrial Plywood.
- E. 2007 Florida Building Code

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 318.
- B. Maintain one copy of each document on site.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for design, fabrication, erection, and removal of formwork.

## 1.06 COORDINATION

- A. Coordinate this Section with other Sections of work which require attachment of components to formwork.
- B. Coordinate formwork with reinforcement installation to provide sufficient concrete cover over reinforcement.

## PART 2 – PRODUCTS

### 2.01 WOOD FORM MATERIALS

- A. Form Materials: At the discretion of the Contractor.

### 2.02 FORMWORK ACCESSORIES

- A. Wall Form Ties: Removable Snap-off type, 316 stainless steel, fixed length, cone type, with waterproofing rubber washer, 1-1/2 inch back break dimension, free of defects that could leave holes larger than 1-inch in concrete surface.
- B. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
- C. Corners Chamfer, wood strip type; 3/4 x 3/4 inch size; maximum possible lengths.
- D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

### 3.02 EARTH FORMS

- A. Earth forms are not permitted.

### 3.03 ERECTION - FORMWORK

- A. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 318.

- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.
- E. Obtain approval before framing openings in structural members which are not indicated on Drawings.
- F. Provide chamfer strips on external corners of all exposed concrete elements.
- G. Induce camber on existing roof slab structure prior to casting concrete.

#### 3.04 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water.
- D. Keep surfaces coated prior to placement of concrete.

#### 3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items which will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, regrets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- D. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install waterstops continuous without displacing reinforcement. Heat seal joints watertight. Conform to manufacturers recommendations.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

### 3.06 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Use compressed air to remove remaining foreign matter.

### 3.07 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 318.
- B. Camber slabs and beams 1/4 inch per 10 feet in accordance with ACI 318.

### 3.08 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
- B. Do not reuse wood formwork more than three times for concrete surfaces to be exposed to view.

### 3.09 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

END OF SECTION

SECTION 03200  
CONCRETE REINFORCEMENT

PART 1 — GENERAL

1.01 WORK INCLUDED

- A. Reinforcing steel bars, wire fabric, and accessories for cast-in-place and precast concrete.

1.02 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Section 01300 - Submittals
- B. Section 03100 - Concrete Formwork
- C. Section 03300 - Cast-in-Place Concrete
- D. Section 03410 – Structural Precast Concrete

1.03 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 318 – Building Code Requirements for Reinforced Concrete
- C. ACI SP-66 - American Concrete Institute -Detailing Manual.
- D. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
- E. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- F. ANSI/AWS D1.4 - Structural Welding Code for Reinforcing Steel.
- G. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- H. ASTM A704 - Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
- I. AWS D12.1 - Welding Reinforcement Steel, Metal Inserts, and Connections in Reinforced Concrete Construction.
- J. CRSI -Concrete Reinforcing Steel Institute -Manual of Practice.
- K. CRSI 63 -Recommended Practice For Placing Reinforcing Bars.

L. CRSI 65 - Recommended Practice For Placing Bar Supports, Specifications, and Nomenclature.

M. 2020 Florida Building Code

#### 1.04 SUBMITTALS

A. Submit shop drawings under provisions of Section 01300.

B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

#### 1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 318.

B. Maintain one copy of document on site.

#### 1.06 QUALIFICATIONS

A. Welders' Certificates: Submit under provisions of Section 01300 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

#### 1.07 COORDINATION

A. Coordinate with placement of formwork, formed openings, and other Work.

### PART 2 — PRODUCTS

#### 2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615, 60-ksi yield grade; deformed billet steel bars, unfinished.

B. Welded Steel Wire Fabric: ASTM A185 Plain Type; in flat sheets unfinished.

#### 2.02 ACCESSORY MATERIALS

A. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.

- B. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather-exposed Concrete Surfaces: Plastic coated steel or stainless steel type; size and shape as required.

## 2.03 FABRICATION

- A. Fabricate concrete reinforcing in accordance with ACI 318.
- B. Locate reinforcing splices not indicated on drawings, at point of minimum stress. Review location of splices with Engineer.

## PART 3 — EXECUTION

### 3.01 PLACEMENT

- A. Place, support, and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcing according to ACI-318 and plans.

END OF SECTION

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1 — GENERAL

- 1.01 Notice: Engineer shall be given 48 hours advance notice to all concrete placements and no concrete shall be placed without approval of Engineer.

1.02 WORK INCLUDED

- A. Cast-in-place concrete foundations, walls, slab-on-grade, equipment pads, underground concrete vaults and structures, pipe supports, curbs, and sidewalks.

1.03 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Section 01300 – Submittals  
B. Section 01410 – Testing Laboratory Services  
C. Section 03100 - Concrete Formwork  
D. Section 03200 - Concrete Reinforcement

1.04 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.  
B. ACI 318 - Building Code Requirements for Reinforced Concrete  
C. ASTM C33 - Concrete Aggregates.  
D. FDOT Standard Specifications for Road and Bridge Construction  
E. ASTM C94 - Ready-mixed Concrete.  
F. ASTM C150 - Portland cement.  
G. ASTM C260 - Air Entraining Admixtures for Concrete.  
H. ASTM C494 – Chemical Admixtures for Concrete  
I. ASTM C618 – Pozzolonic Materials.

1.05 QUALITY ASSURANCE

- A. Perform Work: in accordance with ACI 301 and FDOT Standard Specifications.  
B. Obtain materials for same source throughout the Work.

- C. Submit manufacturer's certification that materials meet specification requirements.
- D. Submit ready-mix delivery tickets, ASTM C94-78.

#### 1.06 TESTS

- A. Testing and analysis of concrete will be performed under provisions of this Section and Section 01410.
- B. Submit proposed mix design of each class of concrete to Engineer for review prior to commencement of work in accordance with Submittal Section. Submittal shall include proposed location for each class of concrete.
- C. Independent Testing laboratory shall take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- D. Provide 5 cylinders per set. Test one at 3 days, one at 7 days, two at 28 days, and hold one.
- E. Slump tests shall be taken for every truck delivery and each set of test cylinders taken.
- F. In general, cylinders shall be taken for each concrete pour event, and every 50 cubic yards placed.
- G. All tests failing minimum specified criteria shall be billed to and paid for by the Contractor.

#### 1.07 SUBMITTALS

- A. Submit product data under provisions of Section 01300 for Fine and Coarse aggregates, admixtures, concrete mix design, joint devices, attachment accessories, and curing compounds.

### PART 2 — PRODUCTS

#### 2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150 -Type II Cement.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean potable water.

#### 2.02 ADMIXTURES

- A. Air Entrainment: ASTM C260. Use Darex II AEA or equal.

- B. Water-reducing admixture may be used and must meet ASTM C-494 as a Type A and Type D. Use WRDA 64 or equal. Add in accordance with ACI-350.
- C. Use of calcium chloride is not permitted.
- D. Air entraining agent to normal weight concrete mix if used, shall not exceed 4%.
- E. Superplasticizers must meet all ASTM requirements and have compatibility test results with approved mix design.

## 2.03 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.
- B. Provide concrete to satisfy the following requirements
  - 1. Compressive Strength (28 days): 3000 psi for sidewalks and curbs, 4000 psi all other locations.
  - 2. Water/Cement ratio maximum 0.48 without admixtures by weight.
  - 3. Fly Ash Content: maximum 15% of cement content, Type F only.
  - 4. Slump  $4 \pm 1$  inch regular, 7-8 inch with superplasticizer, 6-8 inch pea rock pump mix.
- C. Use set-retarding admixtures during hot weather only when approved by Engineer.
- D. Air entraining agent may be considered in concrete mix, however, content must be kept to a minimum, and carefully monitored for addition to mix design.
- E. Superplasticizer shall be used in all R/C walls that are water holding structures; i.e., clearwell, containment walls, etc.

## 2.04 ACCESSORIES

- A. Vapor Barrier: 10 mil thick clear polyethylene film, type recommended for below-grade application.
- B. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.
- C. Water Stop (PVC): 4" x 3/16" water stop, Dumbell polyvinylchloride Greenstreak - Style 741 or approved equivalent.
- D. Water Stop (Other): Bentonite type strips Rx101, or applicable to condition, as manufactured by Volclay, or equal.

- E. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.
- F. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel or Stainless steel type; size and shape as required. Do not use concrete or clay bricks to support reinforcing.
- G. Backing rod and sealant as indicated on drawings for construction joints.

## PART 3 — EXECUTION

### 3.01 INSPECTION

- A. Verify reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.
- B. Verify site dewatering conditions. All foundations shall be cast in the dry.
- C. Verify requirements for concrete cover over reinforcement.
- D. Clean forms of trash, wood, excess steel, and deleterious materials.

### 3.02 PREPARATION

- A. Install vapor barrier under all slabs, footings, and other concrete exposed to earth. Lap joints a minimum of 6 inches. Do not disturb or damage vapor barrier while placing concrete. Repair damaged vapor barrier.
- B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, clean holes, insert steel dowels and epoxy in accordance with manufacturer's installation instructions keeping the minimum embedments specified on drawings.
- C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

### 3.03 PLACING CONCRETE

- A. Notify Engineer and City's Representative minimum 48 hours prior to commencement of concreting operations.
- B. Place concrete in accordance with ACI 301 and FDOT Standard Specifications.
- C. Hot Weather Placement ACI 301.
- D. Cold Weather Placement ACI 301.
- E. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

- F. Place concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur.
- G. Contractor shall be responsible for means and methods to ensure concrete is poured in a dry area.
- H. Contractor needs to use mechanical vibrating equipment for consolidating concrete and should have a minimum of (2) two operable vibrators on the job.
- I. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- J. Saw cut curb joints within 24 hours after placing. Use 3/16 inch thick blade, cut 1/4 of slab thickness.
- K. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

#### 3.04 FINISHING

- A. Provide formed concrete walls, columns, beams, Class 5 finish above the water line.
- B. Finish concrete floor surfaces in accordance with ACI 301 steel trowel finish.
- C. Finish exterior walking surfaces with light broom.

#### 3.05 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Water cure concrete surfaces in accordance with ACI 301 for 7 days or apply curing compound.
- C. Contractor shall use curing compounds for vertical surfaces.

#### 3.06 PATCHING

- A. Notify Engineer immediately upon removal of forms. No surfaces are to be patched or backfilled prior to being reviewed by the Engineer.
- B. Patch imperfections as requested by the Engineer or his field representative in accordance with ACI 301 and FDOT Standard Specifications.
- D. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

### 3.07 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required levels, lines, details, elevations, dimensions, tolerances, or specified requirements.
- B. Repair or replace concrete not properly placed will be determined by the Engineer or City's Representative.
- C. Unless the removal of a defective slab is required by the Engineer, defective surfaces, such as honeycomb, shall be cut out entirely until homogeneous concrete is met, even if it means going through the slab.
- D. Such areas shall be coated with an approved epoxy bonding material, which shall be applied in accordance with the manufacturer's instruction, before damp packing the area with a mix consisting of one part of Portland cement and two parts of sand and fine gravel, epoxy and sand mix, or any combination of materials and mixes as the situation dictates in the opinion of the Engineer.
- E. The water content of the damp-pack material shall be such that a ball of the mix may be squeezed in the hand without bringing free water to the surface.
- F. Damp-pack material shall be tamped into place and finished to match adjacent concrete surfaces.
- G. Particular care shall be taken that no sagging of the material will occur.
- H. The bond between any two layers of damp-pack shall be improved through the use of an approved epoxy bond agent.
- I. Surfaces which have been damp-packed shall be kept continuously damp during and for a period of not less than seven days after completing the damp-pack operation, by polyethylene coverings thoroughly taped to the original concrete surface in a manner that loss of moisture, evidence by lack of water droplets on the inside surface of the polyethylene, is avoided. If this moisture condition cannot be maintained, a continuous water cure may be required by the Engineer.
- J. Under no circumstances shall Contractor apply a plaster coat over the honeycomb areas to conceal the existence of the honeycomb in the concrete.
- K. Neither Embeco nor calcium chloride shall be used for filling honeycomb areas, nor shall they be mixed with damp-pack material.
- L. Any concrete with excess air entraining agent will be rejected.

### 3.08 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01410.
- B. Contractor will be required to contact Testing Lab to be present for concrete deliveries.

- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

END OF SECTION

## SECTION 03400

### STRUCTURAL PRECAST CONCRETE

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Precast structures, manholes, and valve boxes.
- B. Connection and supporting devices.

##### 1.02 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ANSI/AWS D1.1 - Structural Welding Code.
- D. ANSI/AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- E. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- F. ANSI/ASTM A416 - Uncoated Seven-wire Stress-relieved Strand for Prestressed Concrete.
- G. ASTM A36 - Structural Steel.
- H. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- I. ASTM A615 - Deformed and Plain Billet-steel Bars for Concrete Reinforcement.
- J. ASTM C150 - Portland cement.
- K. PCI MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
- L. PCI MNL-120 - Design Handbook - Precast and Prestressed Concrete.
- M. UL - Underwriters Laboratories.

##### 1.03 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.
- B. Section 01410 – Testing Laboratory Services

C. Section 03200 - Concrete Reinforcement

1.04 SUBMITTALS

- A. Submit under provisions of the Division 1 Specifications, Section 01300 - Submittals.
- B. Shop Drawings: Indicate layout, unit locations, fabrication details, unit identification marks, reinforcement, connection details, support items, dimensions, openings, and relationship to adjacent materials.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with the requirements of PCI MNL-116.

1.06 QUALIFICATIONS

- A. Fabricator: Company specializing in manufacturing the work of this section with minimum five years documented experience.
- B. Erector: Company specializing in erecting the work of this section with five years documented experience approved by manufacturer.
- C. Design precast concrete members under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.
- D. Welder: Qualified within previous 12 months in accordance with ANSI/AWS D1.1.

1.07 REGULATORY REQUIREMENTS

- A. Conform to ACI 318 and applicable local code for design load and construction requirements applicable to work of this Section.

1.08 PRE-INSTALLATION REQUIREMENTS

- A. Verify with Engineer any field cutting required for all openings.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site.
- B. Handle precast members in position consistent with their shape and design. Lift and support only from approved and designated support points.
- C. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
- D. Protect members to prevent staining, chipping, or spalling of concrete.
- E. Mark each member with date of production and final position in structure.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Cement: Gray Portland, conforming to ASTM C150 Type II, 4,000 psi min. compressive strength.
- B. Aggregate, Sand, Water, and Admixtures: Determined by precast fabricator as appropriate to design requirements and PCI MNL-116.

### 2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615 Grade 60, deformed steel bars.
- B. Welded Steel Wire Fabric: ASTM A185 Plain Type flat sheets galvanized.

### 2.03 ACCESSORIES

- A. Connecting and Supporting Devices: 316 stainless steel Plates, angles, items cast into concrete or items connected to steel framing members, inserts, conforming to PCI MNL-123; unfinished. Do not paint surfaces in contact with concrete or surfaces requiring field welding.
- B. Grout: Non-shrink, Non-metallic, minimum yield strength of 7,000 psi at 28 days.
- C. Bolts, Nuts and Washers: 316 stainless steel type recommended for structural steel joints.

### 2.04 FABRICATION

- A. Fabrication procedure to conform to PCI MNL-116.
- B. Maintain plant records and quality control program during production of precast members. Make records available upon request.
- C. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on shop drawings.
- D. Tension reinforcement tendons as required to achieve design load criteria.
- E. Provide required openings with a dimension larger than 8 inches and embed accessories provided by other Sections, at indicated locations.

### 2.05 FINISHES

- A. Ensure exposed-to-view finish surfaces of precast concrete members are uniform in color and appearance.
- B. Cure members under identical conditions to develop required concrete quality and minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

- C. Provide 3/4" chamfer on all exposed concrete edges unless otherwise specified.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify that site conditions are ready to receive work and field measurements are as shown on Drawings.

### 3.02 PREPARATION

- A. Prepare support equipment for the erection procedure, temporary bracing, and induced loads during erection.

### 3.03 ERECTION

- A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- B. Align and maintain uniform horizontal and vertical joints as erection progresses.
- C. Maintain temporary bracing in place until final support is provided.

### 3.04 PROTECTION

- A. Protect structures from damage caused by erection operations.

### 3.05 CLEANING

- A. Clean weld marks, dirt, or blemishes from surface of exposed structures.

END OF SECTION

## SECTION 05100

### ACCESS HATCHES

#### PART 1 - GENERAL

##### 1.01 SCOPE

- A. The work includes supply and installation of the access hatches as shown on the construction plans and specified herein, required for a complete and functional installation.

##### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03300 - Cast-in-Place Concrete
- B. Section 05500 - Miscellaneous Metals

##### 1.03 SUBMITTALS

- A. The Contractor shall submit shop drawings and other information to the Engineer, for review, in accordance with Section 01300. No fabrication shall be started until shop drawings have been reviewed and approved by the Engineer.

#### PART 2 - PRODUCTS

##### 2.01 HATCHES DESCRIPTION

- A. The hatches for wetwell shall be a pedestrian rated for 300 p.s.f. live loads.

All material shall be aluminum unless otherwise noted. Cover shall be ¼-inch thick aluminum diamond plate cover reinforced for a 300 p.s.f. live load. The cover shall be holes spaced around the perimeter for connection to the FRP wetwell flange. The door shall be equipped with a 316 stainless steel flush lifting handle and 316 stainless steel hold open arm with red vinyl grip that automatically keeps the cover in its open/upright position.

Lift Assist: Open, 316 stainless steel, bolt-on, vertical compression springs for easy opening.

Hardware: Tamper resistant 316 stainless steel hinges with recessed 316 stainless steel pins and lugs.

Security: The cover shall be a recessed staple for a padlock.

Manufacturer: Halliday Products, Inc. Model C1R or approved equal.

Warranty: Manufacturer shall guarantee against defects in materials or

workmanship for a period of 10 years.

- B. The hatches for valve vault shall be a pedestrian rated for 300 p.s.f. live loads.

All material shall be aluminum unless otherwise noted. Cover shall be ¼-inch thick aluminum diamond plate cover reinforced for a 300 p.s.f. live load. The cover shall be holes spaced around the perimeter for connection to the FRP wetwell flange. The door shall be equipped with a 316 stainless steel flush lifting handle and 316 stainless steel hold open arm with red vinyl grip that automatically keeps the cover in its open/upright position.

Lift Assist: Open, 316 stainless steel, bolt-on, vertical compression springs for easy opening.

Hardware: Tamper resistant 316 stainless steel hinges with recessed 316 stainless steel pins and lugs.

Security: The cover shall be a recessed staple for a padlock.

Manufacturer: Halliday Products, Inc. Model C2R or approved equal.

Warranty: Manufacturer shall guarantee against defects in materials or workmanship for a period of 10 years.

## 2.02 PROTECTIVE COATINGS

- A. Aluminum to be placed adjacent to masonry, concrete, or dissimilar metals shall be protected with an isolating coating of Bitumastic and/or felt.

## PART 3 - EXECUTION

### 3.01 FABRICATION

- A. General: All workmanship shall be first class and conform to recognized and accepted best practice. All structural materials shall be thoroughly straightened in the shop by methods that will not injure them before templates are placed on same for laying out and before any work is done upon them. Finished members shall be absolutely straight and free from open joints and distortions of any kind. All shearings shall be neatly finished. Flame cutting may be used in the preparation of the various members provided this operation is performed by a machine. All necessary fillets, connections, brackets, posts, and other details not shown on the drawings, but necessary for the work, shall be furnished by the Contractor. Fabrication shall be by welding except where riveted construction is specifically allowed by the Specifications or Engineer.
- B. Aluminum: Aluminum fabrication shall meet the applicable requirements of the Aluminum Construction Manual, Specifications for Aluminum Structures.

- C. Welding: All welding shall be in accordance with the latest revised standards and recommendations of the American Welding Society. The welding of all joints shall produce complete fusion with the parent metal and shall be free from deleterious metals and cracks. Machine welding shall be used insofar as practicable. Tack welding will not be permitted on exposed surfaces. Finished welded joints shall be reasonably smooth and free from grooves, depressions, or other irregularities. Any other irregularities shall be corrected by welding and/or grinding. All scale or flux shall be removed after each pass. All flush welds of butt joints shall be ground smooth where exposed to view.
- D. Castings: Castings shall be tough, sound, and free from blow holes, shrinkage cracks, or other defects. Castings shall be smooth and clean. Units that have been plugged or filled will be rejected.

### 3.02 INSTALLATION

- A. All access hatches shall be installed in conformance with Specifications and details as shown on the Drawings, or shop drawings. Installation and erection shall conform to the best practice with each item set plumb, level, true to line, and securely anchored in its proper place.

END OF SECTION

The Balance of this page intentionally left blank

## SECTION 05500

### MISCELLANEOUS METALS

#### PART 1 - GENERAL

##### 1.01 SCOPE

- A. This Section includes the furnishing and installation of fabricated metal work which applies to all sections, unless otherwise noted.

##### 1.02 REFERENCE SPECIFICATIONS AND STANDARDS ARE REFERRED TO BY ABBREVIATION AS FOLLOWS:

- |    |   |          |
|----|---|----------|
| A. | The Aluminum Association  | AA       |
| B. | American Institute of Steel Construction  | AISC     |
| C. | American National Standards Institute   | ANSI     |
| D. | American Society for Testing and Materials  | ASTM     |
| E. | American Welding Society  | AWS      |
| F. | American Society of Civil Engineers/<br>Structural Engineering Institute                                | ASCE/SEI |
| G. | National Association of Architectural<br>Metal Manufacturers  | NAAMM    |
| H. | Steel Structures Painting Council   | SSPC     |
| I. | ASTM A276 – Specification for stainless and heat-resisting steel bars and shapes.                       |          |
| J. | ASTM F293 – Stainless steel specification for bolts/hex cap screws/studs                                |          |
| K. | ASTM F294 – Specification for Stainless steel nuts  |          |
| L. | ASCE/SEI 8-02 - Standard Specification for the Design of Cold-formed Stainless Steel Structural Members |          |

##### 1.03 QUALITY ASSURANCE

- A. Portions of the design not shown shall be completed by the fabricator in accordance with the latest edition of Specifications for Design, Fabrication and Erection of Structural Steel for Buildings of the AISC.
- B. Shop fabricated connections may be bolted or welded. Field connections shall be bolted.

- C. Burning/torching for enlarging holes will not be acceptable except with written permission of the Engineer.
- D. Responsibility for all errors in fabrication and correct fitting of structures shown on the shop drawings is the Contractor's responsibility.

#### 1.04 REGULATORY REQUIREMENTS

- A. Metal fabrication materials shall meet the requirements of the following ASTM Standards and Specifications but limited to:
  - 1. Aluminum Alloy, plate and sheet ASTM B209-3003-H14, structure shapes ASTM B308-6061-T5, structural pipe and tube ASTM B429, castings ASTM B214.
  - 2. Steel stud anchors for embedded plates, A-108, grade 1020, 60 ksi.
  - 3. Galvanizing, A123.
- B. Comply with the provisions of the following standards except as otherwise shown or specified.
  - 1. AA Specifications for aluminum structures.
  - 2. AISC Specifications for design, fabrication and erection of structural steel for buildings.
  - 3. AWS code for welding in building construction.

#### 1.05 SUBMITTALS

- A. Submit shop drawings and manufacturer's descriptive literature as applicable for all metal fabrications in accordance with Section 01300. No items shall be fabricated prior to reviewing approval by Engineer. Minimum scale of drawings and elevations shall be 3/4 in. equals 1 ft., details enlarged to adequate size for clarity, show anchorage.
- B. Where certain equipment and the like require unique support, provide such members only after careful coordination of shop drawings for the equipment.
- C. Welders Certificates: Submit under provisions of Section 01300, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

#### 1.06 PRODUCT HANDLING

- A. Use all means necessary to protect the Products of this Section before, during, and after installation and to protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the City.
- C. Coordinate delivery of metal fabrications with work of other Sections.

## PART 2 - PRODUCTS

### 2.01 SHOP FABRICATED PRODUCTS

- A. Provide anchor bolts as shown as well as for fabricated and structural metal items. Do not paint bolts.
- B. Provide inserts and sleeves for concrete as shown and as required.
- C. Provide miscellaneous metal frames and supports fabricated of structural shapes and plates.
- D. Fit and shop assemble items in largest practical sections, for delivery to site.
- E. Fabricate items with joints tightly fitted and secured.
- F. Continuously seal joined members by continuous welds. Provide vent holes in hollow members before galvanizing.
- G. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- H. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- I. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- J. Punch and shear to leave smooth surfaces. Weld permanent connections, grind exposed welds smooth. Avoid screws and bolts where possible unless otherwise noted. When used and where exposed, countersink heads and draw up tight. Provide holes and connections for work of other trades.
- K. Shop painting of ferrous items, except those galvanized, shall be as specified in Section 09900 - Painting.

### 2.02 FASTENERS

- A. Provide fasteners for all items under this Section. All nuts, bolts, washers, back up rings, etc. shall be 316 SS unless otherwise called out on the drawings or specified elsewhere herein.

### 2.03 PIPE SUPPORTS

- A. Pipe support straps shall be 316 SS unless otherwise noted.
- B. Metal pipe support fabrication shall be 316 SS unless otherwise noted.

## 2.04 MISCELLANEOUS FABRICATIONS

- A. Unless noted otherwise on the drawings or specified differently in other sections, all miscellaneous metal fabrications shall be 316 stainless steel.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

### 3.02 PREPARATION

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

### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on shop drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain Engineer approval prior to site cutting or making adjustments not scheduled.
- F. Verify that supports and anchors are correctly positioned.
- G. Verify that opening sizes and dimensional variations are acceptable to suit grading, railing, and stairs tolerances.
- H. Verify critical dimensions of the work on the job. Form items to accurate sizes and shapes, with sharp lines and angles.
- I. Protect aluminum in contact with concrete and dissimilar material with 1/4" neoprene, or bitumastic coating.
- J. 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 not shop welded because of size limitations.

### 3.04 TOLERANCES

- A. Conform to ANSI/NAAMM A202.1.
- B. Maximum space between sections: ¼ inch.

- C. Maximum variation from top surface plane of sections:  $\frac{1}{4}$  inch.

END OF SECTION

## SECTION 09900

### PAINTING

#### PART 1 - GENERAL

##### 1.01 SCOPE

- A. Furnish all labor, surface preparation and coating material, tools, rigging, lighting, ventilation, and other related items of equipment and materials necessary to clean, prepare, coat, cure and cleanup a complete coating system on all interior and exterior exposed items and surfaces throughout the project, except as otherwise specified or shown on the drawings.
  - 1. Surface preparation, priming, and coats of paint specified are in addition to shop priming and surface treatment specified under other sections of the work.
  - 2. The scope of work shall include the coating of new equipment and surfaces which are constructed by this project.
- B. The work includes field painting of exposed bare and covered pipes and ducts, hangers, exposed steel and iron work, and primed metal surfaces of equipment installed, except as otherwise indicated.
- C. Paint all exposed surfaces normally painted in the execution of a new building project. Where items or surfaces are not specifically mentioned, or are not specifically excluded from the painting work, paint these the same as adjacent similar materials or areas.
- D. Clean, prepare, coat, and cure all surfaces in strict accordance with the manufacturer's published recommendations and specifications.
- E. Perform all work by the use of skilled workpersons in a safe and productive manner using equipment and procedures consistent with good coating practices.
- F. Colors are indicated on the Painting Schedule in this section or shown on the drawings. If color or finish is not designated, the City will select these from standard colors available for the materials system specified.

##### 1.02 PAINTING NOT INCLUDED

- A. The following categories of work are not included as part of the field-applied finish work or are included in other sections of these specifications.
  - 1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for structural steel, miscellaneous metal, metal fabrications, hollow metal work, and similar items. Also, for fabricated components such as shop-fabricated or factory-built mechanical and electrical equipment or accessories.

2. Pre-Finished Items: Unless unit is part of an assembly to be painted to match, i.e. - motor, or otherwise shown or specified, do not include painting when factory-finishing or installer finishing is specified.
3. Concealed Surfaces: Unless otherwise shown or specified, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts. Painting of galvanized work that will be concealed in the completed work is not required. Do not paint structural steel to be encased in concrete, nor structural steel specified not to be painted elsewhere. Except for touch-up as specified in Part 3, painting of shop primed structural steel and ferrous metals that will be concealed in the completed work is not required.
4. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise specified.
5. Operating Parts and Labels: Moving parts of operating units, mechanical and electrical parts such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting unless otherwise specified.
  - a. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.
6. Other Surfaces: Do not paint sprinkler heads, fire detection heads, integrally colored stucco, brick masonry, cast stone, stone masonry, or architectural precast concrete, unless otherwise specified.

#### 1.03 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01300 - Submittals

#### 1.04 REFERENCES

- A. ANSI/ASTM D16 - Definitions of terms relating to paint, varnish, lacquer, and related products.
- B. ASTM D2016 - Test method for moisture content of wood.
- C. Steel Structures Painting Council (SSPC).
- D. International Concrete Repair Institute (ICRI)

## 1.05 DEFINITIONS

- A. Conform to ANSI/ASTM D16 for interpretation of terms used in this section.

## 1.06 QUALITY ASSURANCE

- A. Furnish all coating materials by a single manufacturer. Solvent, thinners, and other miscellaneous materials can be supplied by the same manufacturer or by a supplier approved by the manufacturer.
- B. Furnish a statement to the Engineer from the coatings manufacturer that materials to be used by the Contractor comply with the manufacturer's recommendations.
- C. The Engineer reserves the right to require qualification of the product manufacturer and applicator, including satisfactory completion of at least two (2) projects of this nature.
- D. Manufacturer's Inspection Meeting: After set-up for painting but before commencing work, conduct a meeting at the site among representatives of the paint manufacturer, contractor, painting contractor, and Engineer to inspect the facility and review procedures recommended by the manufacturer for the prevailing conditions.

## 1.07 REGULATORY REQUIREMENTS

- A. Comply with all federal, state, and local health and fire regulations when handling and applying paint and coating products.

## 1.08 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's technical information including paint label analysis, surface preparation and application instructions for each material proposed for use. Indicate the surfaces to which each material is to be applied.
- B. Samples; Painting: Submit samples for Engineer's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.
- C. Manufacturer's Certificate: Submit a written certification from the paint manufacturer that materials furnished for the work meet or exceed specified requirements.
- D. Prepare a detailed painting schedule. List each Painting System to be used by Painting System Number, define extent and limits of each system and colors (by name and number) where appropriate.

## 1.09 PRODUCT DELIVERY AND STORAGE

- A. Deliver all materials to the jobsite in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information;
  - 1. Name or title of material.
  - 2. Fed. Spec. number, if applicable.
  - 3. Manufacturer's stock number and date of manufacture.

4. Manufacturer's name.
  5. Contents by volume, for major pigment and vehicle constituents.
  6. Thinning instructions.
  7. Application instructions.
  8. Color name and number.
- B. Store paint materials and painting tools and equipment, including solvents and cleaning material, in a well ventilated, dry area away from high heat. Do not store in buildings or structures in use or being constructed, nor leave overnight therein. Follow manufacturer's recommendations for the safe storage of paints and solvents.
- C. Take precautions to prevent fire hazards and spontaneous combustion.

#### 1.10 SAFETY

- A. Make all necessary provisions regarding materials, equipment, personnel, procedures, and practices, to assure that the work is done safely and that the working area is maintained free of all health and safety hazards.
- B. Observe manufacturer's health and safety precautions when storing, handling, and applying coating materials and cleanup materials containing solvents and/or chemical ingredients.
- C. Direct personnel's attention to all product warnings and information given on the labels of all products.
- D. Ensure that personnel mixing and applying coating materials are equipped with adequate protective clothing and devices (including respirators).
- E. Permit no smoking in the working area.
- F. Permit no item which may produce sparks or open flames in the immediate working area.
- G. Post warning signs outside of the work to apprise personnel of the hazards in the area. Erect barriers where necessary.
- H. Return partially used coating materials that are to be retained to their original containers at the completion of each workday. Tightly reseal containers, wipe material spills, clean and return the containers to the designated storage area.
- I. Remove waste coating materials and contaminated disposable items from the job site and dispose of them at the completion of each workday. Dispose of all items and materials in strict accordance with local, state, and federal regulations.

#### 1.11 JOB CONDITIONS

- A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F and 90 degrees F unless otherwise permitted by the paint manufacturers printed instructions.

- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F and 95 degrees F unless otherwise permitted by the paint manufacturers printed instructions.
- C. Do not apply paint in rain, fog or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.
- E. Exercise caution when attempting to paint in windy conditions. The Contractor is responsible for all damage caused by wind blown paint.

## PART 2 - PRODUCTS

### 2.01 COLORS AND FINISHES

- A. Paint colors, surface treatments, gloss, and finishes are indicated or specified in the "schedules" of the contract documents.
- B. Final acceptance of colors will be from samples applied on the job.
- C. Paint Coordination: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Furnish information to manufacturer's, fabricators, suppliers and others where necessary on the characteristics of the finish materials to be used, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required.

### 2.02 UNDERCOATS AND THINNERS

- A. Undercoats: Provide contrasting color undercoat paint produced by the same manufacturer as the finish coats.
- B. Thinners: Use only thinners approved by the paint manufacturer and use only within recommended limits.

### 2.03 ACCEPTABLE MANUFACTURER'S

- A. All coating references herein are to Tnemec Co., Inc. or Ameron systems.

### 2.04 PAINTING SYSTEMS

- A. Provide a minimum dry film thickness, noted as D.F.T., for the applications listed in the schedule of finishes.
- C. Touch-up shop-applied and field applied prime coats wherever damaged or bare and keep touched-up as necessary before and after installation or erection of the items, to

maintain protection of the metal from rust and corrosion. Clean and touch-up with the same type of primer as initially used.

## 2.05 SCHEDULE OF FINISHES

### A. Steel, galvanized steel and non-ferrous metal

1. Exterior of pipe, equipment and miscellaneous fabrication for indoor or outdoor exposure:

System:	Epoxy / Polyurethane
First Coat:	Series 69 Polyamidoamine Epoxy Primer
D.F.T. (Mils):	3.0 - 5.0
Second Coat:	Series 69 Polyamidoamine Epoxy Topcoat
D.F.T. (Mils):	3.0 - 5.0
Third Coat:	Series 1074U Color Endura-Shield (Aliphatic Acrylic Polyurethane)
D.F.T. (Mils):	2.0 - 4.0
Min D.F.T. (Mils):	11.0

### B. PVC and CPVC Piping and Appurtenances

1. PVC and CPVC pipes, valves, conduits, and accessories (interior):

System:	Polyamide Epoxy Topcoat
Finish Coat:	Series N69 Hi-Build Epoxoline II
D.F.T. (Mils):	4.0 - 6.0

2. PVC and CPVC pipes, valves, conduits, and accessories (exterior):

System:	Polyamide Epoxy Topcoat / Aliphatic Acrylic Polyurethane
First Coat:	Series N69 Hi-Build Epoxoline II
D.F.T. (Mils):	2.0 - 3.0
Second Coat:	Series 1074U Endura-Shield
D.F.T. (Mils):	2.0 - 3.0
Total Coats:	2.0
Total Min D.F.T. (Mils.):	6.0

## 2.06 SCHEDULE OF COLORS:

These colors are provided for painting of piping that has been modified or furnished and installed. Not all piping listed will require painting. City to select building colors.

### A. Liquid Piping:

1. Potable water (finished) - safety blue
2. Wastewater and Drains – dark grey
3. Sewer Water - olive green

### B. Electrical Conduits - Color to match background.

## PART 3 - EXECUTION

### 3.01 FIELD OBSERVATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer. Do not paint over conditions detrimental to the formation of a durable paint bond and film.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application. Do not proceed with the work until unsatisfactory conditions have been corrected.
- C. Provide all necessary equipment, labor, rigging, lighting and other equipment to facilitate inspections.
- D. The Engineer may inspect the Work at any time for compliance with the requirements of the specifications.
- E. The Engineer reserves the right to approve each phase of the Work before further work is done, to halt all Work deemed to be improper or not in compliance with the specification, and to require the Contractor to promptly correct all improper practices or deficient Work.
- F. The Contractor is responsible for any expenses incurred in association with corrective measures required as the result of improper practices and/or defective or deficient work.

### 3.02 GENERAL REQUIREMENTS

- A. Provide adequate explosion - proof lighting sufficient to illuminate clearly the working area without shadows during all surface preparation and coating operations.
- B. Maintain adequate and continuous explosion - proof ventilation in confined areas during all surface preparation and coating operations and during all recoat and curing periods. Provide ventilation of sufficient capacity to maintain a clear atmosphere that is well below explosive and toxic limits. Arrange the ventilation system, including all fans and temporary duct work, so that no still air spaces exist in any area.
- C. Heating devices used to create and/or maintain temperature conditions in compliance with the specification requirements are to be explosion proof and of the type that do not exhaust sooty or oily residues or any other contaminants into the air. Heating devices are not to be used when existing temperature and humidity conditions may create dew point conditions.
- D. Use equipment that is explosion proof and non-sparking. Spray equipment must be recommended by or acceptable to the coating's manufacturer.
- E. Apply caulking material only after the last coat of paint has been applied and has dried hard. Caulking material used must be of a type that is compatible with the specified coating system.

### 3.03 SURFACE PREPARATION

- A. Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate conditions.
- B. Surface preparation shall be conducted to prevent material from contaminating the existing water treatment process.
- C. Fiberglass and PVC materials shall be solvent cleaned according to SSPC-SP1 and scarified by best practical means. Every precaution should be taken to ensure that NO sanding dust is drawn into the degasifiers. Painting contractor to furnish all necessary barrier, drapes, etc. to prevent contamination of the Finish Water.

### 3.04 MATERIAL PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's direction.
- B. Store materials not in actual use in tightly covered containers. maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the materials. Remove the film and if necessary, strain the material before using.

### 3.05 APPLICATION

- A. General
  - 1. Conform to articles "General Requirements" and "Surface Preparation" prior to beginning coating application.
  - 2. Apply paint as specified and in accordance with the manufacturer's printed instructions. Unless otherwise recommended in the manufacturer's printed instructions or specified elsewhere (e.g. Bid Form, Painting System) use brushes for applying first coat on wood and use standard industrial spray equipment, either airless or conventional for applying first coat on metals other than sheetmetal and items fabricated from sheetmetal. For other coats on wood, metal and other substrates, use applicators and techniques best suited for the type of material being applied.
  - 3. Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to ensure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  - 4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces.

5. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
6. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
7. Paint the back sides of access panels, and removable or hinged covers to match the exposed surfaces.
8. Finish exterior doors on tops, bottoms and side edges the same as the exterior faces, unless otherwise indicated or specified.
9. Sand lightly between each succeeding enamel or varnish coat.
10. Omit the field prime coat on shop-primed and touch-up painted metal surfaces which are not to be finish painted and which will not be exposed to view in the completed work. Do not omit primer on metal surfaces specified to be finish coated or on metal surfaces that will be exposed to view in the completed work.
11. Putty nail holes and joints after prime coat is dry.
12. Change colors at corner of stop where colors differ between adjoining rooms or spaces and where door frames match wall colors.
13. Provide a finished coating system free of all runs, sags, cracks, blisters, pinholes, excessive or deficient fill thickness, or any other defects. Correct any such deficiencies by proper removal of the defect and/or recoating.
14. Apply the first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration. Sandblasted surfaces are not to be left uncoated overnight.
15. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
16. Provide minor tinting to each coat of paint in order to differentiate between coats.

B. Minimum Coating Thickness

1. Apply each material at not less than the manufacturer's recommended spreading rate, to establish a total dry film thickness as specified or, if not specified, as recommended by the coating manufacturer.

C. Painting of Mechanical and Electrical Work

Limit painting of mechanical and electrical work to those items exposed in equipment rooms and occupied spaces, and on the exterior of buildings or structures.

1. Mechanical items to be painted include, but are not limited to, the following:
  - a. Piping, conduits, pipe hangers, and supports
  - b. Accessory items

D. Prime Coats

1. Apply a prime coat of material, which is required to be painted or finished, and which has not been prime coated by others.
2. Clean and prime unprimed ferrous metals as soon as possible after delivery of the metals to the job site.
3. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

E. Completed Work

1. Match approved samples for color, texture and coverage.
2. Remove, refinish or repaint work not in compliance with specified requirements.

F. Dry Film Gauge

1. Provide "Noroson Magnetic Dry Film Thickness Gauge" as supplied by the coatings manufacturer.

### 3.06 CLEAN-UP AND PROTECTION

A. Clean-up

1. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each workday.
2. Upon completion of painting work, clean window glass and other paint - splattered surfaces. Remove splattered paint by proper methods of washing and scraping, using care not to scratch or damage finished surfaces.

B. Protection

1. Protect work of other trades, whether to be painted or not, against damage from painting and finishing work.
2. Protect surfaces that might otherwise be damaged by dripping, splashing, or spraying of paint. Correct any damage by cleaning, repairing or replacing and repainting as acceptable to the Engineer.

3. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after the completion of paint operations.
4. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.
5. Repair of damage caused by overspray is the contractor's responsibility.

### 3.07 WARRANTY

- A. If within one year after the date of Substantial Completion, any Work is found to be defective, CONTRACTOR shall promptly, without cost to CITY and in accordance with CITY'S written instructions, either correct such defective Work, or, if it has been rejected by CITY, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not promptly comply with terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, CITY may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, will be charged to the CONTRACTOR.

END OF SECTION

## SECTION 09910

### MANHOLE COATINGS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

It is the intent of this specification to provide for the coating of the manhole interior concrete exposed surfaces.

##### 1.02 WORK INCLUDED

Furnish all materials, equipment, tools and labor necessary to prepare the new manhole concrete and install an interior corrosion barrier wall liner in accordance with these specifications and the drawings. This work shall also include any dewatering/damming as needed to complete the work.

##### 1.03 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01560 – Temporary Controls
- C. Palm Beach County Water Utilities Department Minimum Engineering and Construction Standards Potable Water, Reclaimed Water, and Wastewater Systems.
- D. This specification references standards from the American Society for Testing and Materials, such as: ASTM D-695 (Standard Test Method for Compressive Properties of Rigid Plastics), ASTM D-638 (Standard Test Method for Tensile Properties of Plastics), ASTM C-882 (Standard Test Method for Bond Strength of Epoxy Systems Used with Concrete by Slant Shear), ASTM D-4414 (Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages), ASTM D-2240 (Standard Test Method for Rubber Property—Durometer Hardness), ASTM F1216 (Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube), and ASTM D790 (Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials), and from the National Association of Corrosion Engineers, such as: NACE RP0274 (High Voltage Electrical Inspection of Pipeline Coating Prior to Installation) and NACE 6/SSPC-SP 13 (Surface Preparation of Concrete Grouting) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

##### 1.04 JOB CONDITIONS

- A. The Contractor shall make the necessary provisions to accommodate the liner installation including dewatering/damming as may be required for a successful installation.

- B. Do not apply materials under the following conditions:
  - 1. Temperature exceeding the Manufacturer's recommended maximum or minimum allowable.
  - 2. Overflowing water condition.

## PART 2 - PRODUCTS

### 2.01 PRODUCT, MANUFACTURER/INSTALLER QUALIFICATION REQUIREMENTS

Products and Installers seeking approval must meet all of the following criteria to be deemed Commercially Acceptable:

- A. For installation of systems listed on the applicable approved material list indicate by circling the appropriate name of the manufacturer on the material list. Submit a certification stating the applicator is:
  - 1. Currently approved by the Manufacturer of the specified products.
  - 2. Licensed and qualified in the application of the specified products.
- B. The liner manufacturer shall warrant the corrosion barrier system for all labor and materials cost necessary to repair or replace the failed application, including related work (permits, bypass piping, pumps, flow monitoring, restoration, and record information). Warranty duration shall be for five years.
- C. Products: Restoration and Corrosion Barrier System Manufacturer must be listed on the Department's Approved Materials List. Materials shall be provided by a single manufacturer.

### 2.02 MATERIALS

Furnish and install all labor, materials, equipment, and incidentals required to install a corrosion barrier topcoat composed of a spray applied calcium aluminate cementitious corrosion barrier system. The corrosion barrier system shall be listed on the PBCWUD approved material list. The minimum thickness applied shall be ½-inch cover for all surfaces.

### 2.03 SUBMITTALS

The contractors shall submit for review 3 copies of detailed shop drawings for the coating system to be used on the project.

## PART 3 - EXECUTION

### 3.01 INSTALLATION RESPONSIBILITIES FOR INCIDENTAL ITEMS

- A. It shall be the responsibility of the City to locate and designate all access points open and accessible for the work and provide rights-of-access to these locations. The Contractor shall provide access to water hydrants for cleaning, installation and

other process related work items requiring water. A hydrant meter shall be obtained by the contractor from Palm Beach County Water Utilities Department for water access.

- B. Cleaning of Manhole - The Contractor shall remove all internal debris out of the manhole that will interfere with the installation of corrosion barrier system. Surfaces should be free of oil, grease, laitance, surface water, form release agents and other contaminants that may affect bond. Concrete surfaces shall be pressure washed, abrasive blast or chemically cleaned to remove deteriorated concrete and other contaminants. All debris shall be removed and disposed of off-site in a legal manner. Any active leaks shall be plugged with an approved chemical injection grout and voids will be filled to bring the cleaned concrete surface back to a uniform and sound substrate. If more than 24 hours elapses before the epoxy primer application can commence or chemical cleaning was utilized, the prepared substrate shall be neutralized with clean water.

### 3.02 INSTALLATION/QUALITY CONTROL

### 3.03 INSPECTION

- A. Applied wet film thickness shall be verified per ASTM D-4414, Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages. The minimum wall thickness at any point shall not be less than 87½% of the submitted minimum design wall thickness as required by Paragraph 2.02 of this document.
- B. The liner/coating shall be spark tested per NACE RP0274 at 100 volts per mil of dry film thickness. The dielectric strength of coatings will vary from manufacturer to manufacturer. If this value is unknown, it is recommended that a holiday be created in the coating and the tester be calibrated to the voltage that detects the flaw. A Level 1 NACE Certified coating inspector shall perform the test.
- C. Pull-off adhesion tests shall be performed on the liner/coating per ASTM D-7234. Six tests shall be completed within the wetwell. The minimum pull-off strength shall be 100 psi. The exact test locations shall be coordinated with the Engineer. A Level 2 NACE Certified coating inspector shall perform the test.

### 3.04 CLEAN-UP

Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to or better than the existing conditions prior to the work.

### 3.05 WARRANTY

The liner manufacturer shall warrant the corrosion barrier system for all labor and materials cost necessary to repair or replace the failed application, including related work (permits, bypass piping, pumps, flow monitoring, restoration, and record information). If installation warranty cannot be obtained from the liner manufacturer, the Department may accept the

installer's minimum 5-year labor and material warranty with a performance bond in the amount equal to \$3,000 per manhole. The bond shall be valid for 5-years from the time of acceptance.

END OF SECTION

SECTION 11930  
PUMPS - GENERAL

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

The work covered by this section and the related sections consists of providing all labor, material, equipment and performing all construction required to install pumps, motors, and pump control valves, including all accessories as specified and shown on the drawings.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01300 – Submittals
- C. Section 01730 – Operating and Maintenance Manuals
- D. Section 01720 – Project Record Drawings
- E. Section 11931 – Submersible Wastewater Pumps

1.03 PUMP PERFORMANCE DATA

- A. Certified pump performance data (curves) are to be submitted to the Engineer for the pumps prior to delivery and pump installation. Performance data must be the results of actual pump operation of a complete pump assembly before shipment of pump. Also report amperage and voltage of each power leg, efficiency, horsepower.
- B. Pump shall not overload the motor across the entire operating curve of the pump.

1.04 QUALITY ASSURANCE

- 1. Provide shop drawings in accordance with Section 01300.
- 2. Provide operation and maintenance material and record drawings in accordance with Section 01720 and 01730.
- 3. Provide manufacturer's certification of correct installation after manufacturer's inspection.

PART 2 - PRODUCTS

Not used.

### PART 3 - EXECUTION

- 3.01 Install all equipment in strict conformance with the manufacturer's specifications and industry standards. Perform all work in a workmanlike manner.
- 3.02 Manufacturer's representative for pumps and valves shall inspect installation for correctness and compliance with manufacturers specifications and submit written certification that equipment is ready to be placed in service.
- 3.03 No piping connecting for any of the equipment will be jacked, pried or forced into position in any way. All piping must mate perfectly with the equipment it is attaching prior to installation of flange bolts or other connecting devices.
- 3.04 Clean and then flush thoroughly before making final connections to any assembly.
- 3.05 Field test pumps for conformance to specified operating conditions. Record initial flow, head, voltage and amperage for each power leg, ramp time to speed, full load speed. Adjust tolerances, if necessary and retest. Test pump and motor for amplitude and frequency of vibration. Measure noise (dBA) adjacent, at 10 ft., at 50- ft. Tests shall be performed to the satisfaction of the Engineer and meet the requirements of the Hydraulic Institute.
- 3.06 Store spare pumps, parts, drivers, etc. in strict accordance with manufacturer's recommendations. Notify the City in writing of any special storage maintenance required, and provide such maintenance until final acceptance of contract.
- 3.07 Provide seal water piping as appropriate from nearest supply, including cut-off valve, and/or solenoid valve. All seal water piping to be installed by the qualified pump manufacturer.
- 3.08 Provide seal drain piping to nearest drain, as appropriate.
- 3.09 Pump impellers, bowl assemblies, tee head piping and all material of pump assembly must have smooth finish to minimize pitting corrosion potential.
- 3.10 All pumps shall meet or exceed the standards of the National Hydraulic Institute.

END OF SECTION

## SECTION 11931

### SUBMERSIBLE WASTEWATER PUMPS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION OF WORK

The work covered by this section and the related sections consists of providing all labor, material, equipment and performing all construction required to furnish and install two (2) grinder wastewater pumps in a wet pit configuration complete with pump bases, guide rail assemblies, and all accessories as specified herein and shown on the drawings. This section includes electric submersible pump(s) to be supplied with motor, volute, mounting brackets, power cable and accessories.

##### 1.02 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01300 – Submittals
- C. Section 11930 – Pumps – General
- D. Section 15100 - Piping and Valves
- E. Section 16000 - Electrical General Requirements

##### 1.03 QUALITY ASSURANCE

- A. Provide shop drawings in maintenance material in accordance with Section 01300. Shop drawings shall be provided to show compliance with these specifications, plans or other specifications that will influence the proper operation of the pump(s). Shop drawings for approval must consist of:
  - 1. Pump Performance Curves
  - 2. Pump Outline Drawing
  - 3. Station Drawing for Accessories.
  - 4. Electrical Motor Data.
  - 5. Control Drawing and Data.
  - 6. Access Frame Drawing.
  - 7. Typical Installation Guides.
  - 8. Technical Manuals.
  - 9. Parts List.
  - 10. Printed Warranty.
  - 11. Manufacturer's Equipment Storage Recommendations.
  - 12. Manufacturer's Standard Recommended Start-Up Report Form.

Lack of the above requested submittal data is cause for rejection.

- B. Provide operation and maintenance material and record drawings in accordance with Section 01730.
- C. Provide manufacturer's certification of correct installation after manufacturer's inspection.

## PART 2 - PRODUCTS

### 2.01 SUBMERSIBLE WASTEWATER PUMPS

#### A. Requirements

1. The grinder pumps shall be heavy duty, electric submersible rated, with special cutters to reduce sewage to a fine slurry designed for handling raw, unscreened sewage and wastewater and shall be fully guaranteed for this use.
2. The pumps provided shall be capable of continuous operating in ambient liquid temperature conditions up to 104 degree F.
3. The pump and motor unit shall be suitable for continuous operation at full nameplate load in a submerged position in a wet pit installation and with an automatic connection to the discharge pipe.
4. The pump and motor unit shall be suitable for continuous operation in wet-pit conditions.
5. The pump, mechanical seals and motor units provided under this specification shall be from the same manufacturer in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty.

Pump performance shall be non-overloading across the entire performance curve and shall not exceed 4 HP across normal operating conditions. Each pump shall meet the following design conditions:

<u>Flow (gpm)</u>	<u>Head (Ft.)</u>	<u>Min Effic. (hydr.)</u>	<u>Max. Horsepower (HP)</u>
0	95	--	--
25	82	22.5	2.8
55	52	27	2.3

Pump and motor shall be Grundfos SEG.A15.30.EX.2, Sulzer/ABS PIR PE28/2-C-60HZ, or Flygt model MP3085(X).172 Type HT, impeller diameter 133mm, utilizing the semi-open multi-channel impellers with integral grinder cutter pump for wastewater handling.

Each pump shall be equipped with up to a 4 HP submersible explosion proof electric motor, connected for operation on 230 volts, 3 phase, 60 hertz, 4 wire service with 50 feet of cable suitable for outdoor pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

#### B. Pump Design

The pump shall be supplied with a mating cast iron discharge connection. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two 316 stainless steel guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact or profile gasket. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with 20 feet of 316 stainless steel lifting chain. The working load of the lifting system shall be 50% greater than the pump unit weight.

C. Pump Construction

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be AISI type 304 stainless steel construction. All exterior metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate and a polyester resin enamel finish.

All O-rings shall be of Nitrile rubber. The lifting handle shall be stainless steel.

D. Cooling System

Each pump motor shall be sufficiently cooled by the surrounding environment or pumped media.

E. Cable Entry Seal

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal.

A JUNCTION BOX SHALL BE COMPLETELY SEALED OFF FROM THE PUMPED MEDIA. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

F. Motor

The pump motor shall be a Factory Mutual Research (FM) approved explosion proof, NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or

other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of withstanding no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and the pump shall be produced by the same manufacturer.

The combined motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.10. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C (104°F) ambient and shall have a NEMA Class B maximum operating temperature rise of 80° C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out. The motor shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

G. Bearings

The pump shaft shall rotate on two single row ball bearings. Motor bearings shall be permanently grease lubricated.

H. Mechanical Seal

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro- dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion resistant Tungsten Carbide or Silicon Carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary ceramic seal ring and one positively driven rotating carbon seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor DEPEND ON DIRECTION OF ROTATION FOR SEALING.

Seal lubricant shall be non-hazardous.

I. Pump Shaft

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft; couplings shall not be acceptable. The shaft shall be ASTM type 431 stainless steel.

J. Impeller

The Impeller(s) shall be of gray cast iron, Class 30B, dynamically balanced, single shrouded design having a long throughlet without acute turns. The impellers shall be capable of handling fine slurry from the special cutters. Impeller(s) shall be taper collet fitted and retained with an Allen head bolt. All impellers shall be coated with an acrylic dispersion zinc phosphate primer.

K. Volute

Pump volute(s) shall be single-piece grey cast iron, Class 35B, non-concentric design with smooth passages large enough to pass any media that may enter the impeller. Minimum inlet and discharge size shall be as specified.

## PART 3 – EXECUTION

### 3.01 SUBMERSIBLE WASTEWATER PUMPS

- A. Install all equipment in strict conformance with the manufacturer's specifications and industry standards.
- B. Manufacturer's representative for pump shall inspect installation for correctness and compliance with manufacturer's specifications and submit written certification that equipment is ready to be placed in service.
- C. No piping connecting any of the equipment will be jacked, pried or forced in to position in any way. All piping must mate perfectly with the equipment it is attaching prior to installation of flange bolts or other connecting devices.
- D. Spare Parts
- E. Store spare pumps, parts, drivers, etc. in strict accordance with manufacturer's recommendations. Notify the City in writing of any special storage maintenance required, and provide such maintenance until final acceptance of contract.

### 3.02 TESTING

- A. Testing performed upon each pump shall include the following inspections:
  - 1. Impeller, motor rating and electrical connections shall be checked for compliance with this specification.
  - 2. Prior to submergence, each pump shall be run dry to establish correct rotation.
  - 3. Motor and cable insulation shall be tested for moisture content or insulation defects.

- B. A written quality assurance record confirming the above testing/inspections shall be supplied with each pump at the time of shipment.
- C. Each pump (when specified) shall be tested in accordance with the latest test code of the Hydraulic Institute (H.I.) at the manufacturer to determine head vs. capacity and kilowatt draw required. Witness tests shall be available at the factory upon request.
- D. The pump(s) shall be rejected if the above requirements are not satisfied.

### 3.03 START-UP SERVICE

- A. The equipment manufacturer shall furnish the services of a qualified factory trained field service engineer for 8-hour working day(s) at the site to inspect the installation, perform start-up and instruct the City's personnel on the operation and maintenance of the pumping units. After the pumps have been completely installed and wired, the contractor shall have the manufacturer do the following:
  - 1. Megger stator and power cables.
  - 2. Check seal lubrication.
  - 3. Confirm for proper rotation.
  - 4. Confirm power supply voltage.
  - 5. Confirm pump flow as measured by existing flow meter.
  - 6. Confirm pump discharge pressures as measured by calibrated gauges, converted to feet of liquid pumped.
  - 7. Based on field test data, confirm pump performance corresponds to the pump performance curve.
  - 8. Measure motor operating load and no load current.
  - 9. Check pressure control operation and sequence.

### 3.04 FACTORY SERVICE

Factory-Approved service facilities with qualified factory-trained mechanics shall be available for prompt emergency and routine service.

### 3.05 GUARANTEE

In addition to the general guarantee required elsewhere in these specifications, the pump manufacturer shall furnish the City with a written warranty to cover the pump(s) and motor(s) against defects in workmanship and material for a period of five (5) years or 10,000 hours of operation under normal use and service. The pump manufacturer will pay a pro-rated cost of all replacement parts and repair labor from the date of shipment of the pump unit. Pumps repaired under warranty will be returned to the City freight prepaid. The warranty shall be in printed form and previously published as the manufacturer's standard warranty for all similar units manufactured.

END OF SECTION

## SECTION 13441

### INSTRUMENTATION COMPONENTS

#### PART 1 - GENERAL

##### 1.01 SCOPE

This section provides for instrumentation system components. The instrumentation components shall be furnished, installed, tested and calibrated complete, as described in this section, relevant other sections and as shown on the drawings.

##### 1.02 RELATED SPECIFICATIONS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 15100 - Piping and Valves

##### 1.03 QUALITY CONTROL

- A. Instrumentation components shall conform to ISA standards.

##### 1.04 SUBMITTALS

- A. Submittals shall conform to Section 01300.
- B. Provide component mounting and/or installation details as per manufacturers requirements.

##### 1.05 MANUFACTURER CONTINUITY

- A. Wherever possible, all components shall be furnished from one manufacturer in order to facilitate installation, calibration, system function and City operation and maintenance.
- B. All components furnished herein shall be compatible with other portions of the control system specified elsewhere.

##### 1.06 RESPONSIBILITY

- A. Instrumentation shall be the responsibility of the instrumentation system supplier or electrician.

#### PART 2 – PRODUCTS

##### 2.01 PRESSURE DEVICES

A. Pressure Gauge

The pressure gages shall be liquid-filled, bourdon tube gauges for line or panel mounting, as required. Gauges shall have bourdon tubes of 316 stainless steel, and 316SS connectors. Cases shall be stainless steel, with acrylic or shatter proof glass windows. Gauges shall be 4-1/2" diameter, with 1/2" MNPT bottom mount connections. Scales will be black on white background, 270 deg. span, appropriate to the application. Normal reading shall be at 1/2-2/3 of full scale. Gauge range shall be 0-60 psi as required by the stream which it is monitoring.

Gauges shall be equipped with a 316 stainless steel isolation diaphragm as called for on the drawings. The bourdon tube shall be evacuated and filled with oil prior to assembly of the gauge with the isolator. Gauges and isolators shall be factory assembled and shipped as a unit. Isolation diaphragm shall be Standard Series 42 as manufactured by Red Valve Company, Inc.

All gauges shall be installed with snubbers, isolation tees for testing, and isolation ball valves.

Pressure gauges shall be as manufactured by Ashcroft, or U.S. Gauge.

## PART 3 – EXECUTION

### 3.01 DRAWINGS AND DATA

- A. Complete fabrication, assembly, and installation drawings; wiring and schematic diagrams; and details, specifications, and data covering the materials used parts, devices, and accessories forming a part of the equipment furnished shall be submitted in accordance with submittals section. Submittal data shall be grouped and submitted in three separate stages. Each stage submittal shall be substantially complete. Individual drawings and data sheets submitted at random intervals will not be accepted for review. Instrument tag numbers indicated on the contract drawings shall be referenced where applicable.

### 3.02 INSTALLATION

- A. Installation shall be in complete accordance with manufacturer's instructions and recommendations.
- B. All electrical connections shall be made in conformance with the requirements of Division 16, Electrical.
- C. Once installation is complete, touch up damaged paint with manufacturer supplied paint.

### 3.03 START-UP AND TEST

- A. Contractor shall make adjustments required to place system in proper operating condition. Contractor shall field test and calibrate the equipment to assure that the system operates in accordance with these Specifications and to the satisfaction of the Engineer.

- B. Manufacturer's representative shall check and approve the installation before operation and assist Contractor in performing field tests and in calibration of the equipment.
- C. Contractor and system supplier shall provide the services of a factory-trained operating specialist for an uninterrupted eight-hour period on site (not including travel time) for the instruction of the City's operating personnel.

END OF SECTION

## SECTION 15100

### PIPING AND VALVES

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Furnish and install all piping, fittings, valves, and appurtenances as shown on the drawings, specified herein, and as required for a complete and functional system. In general, include all piping from tie-ins to and from equipment as shown on the drawings, including all piping appurtenances for a complete, operating piping system as specified herein.

##### 1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Section 01300 – Submittals
- C. Section 01720 – Project Record Drawings

##### 1.03 REFERENCES

- A. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb Rammer and an 18--inch Drop.
- B. ANSI/ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- C. ANSI/AWWA C104 – Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- D. ANSI/AWWA C105 – Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
- E. ANSI/AWWA C110 – Standard for Ductile-Iron and Gray-Iron Fittings, 3 -inch Through 48 -inch for Water and Other Liquids.
- F. ANSI/AWWA C111 – Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- G. ANSI/AWWA C115 – Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray Iron Treaded Flanges.
- H. ANSI/AWWA C150 – Standard for the Thickness Design of Ductile-Iron Pipe.

- I. ANSI/AWWA C151 – Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
- J. ANSI/AWWA C153 – Standard for Ductile-Iron Compact Fittings, 3 -inch Through 24 -inch and 54 -inch Through 64 -inch for Water Service.
- K. AWWA C210 – Standard for Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
- L. AWWA C509 – Standard for Resilient-Seated Gate Valves for Water Supply Service.
- M. AWWA C512 – Standard for Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
- N. AWWA C550 - Standard for Protective Epoxy Interior Coatings for Valves and Hydrants
- O. AWWA C600 – Standards for Installation of Ductile-Iron Water Mains and Their Appurtenances.
- P. AWWA C605 – Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
- Q. AWWA C606 – Standard for Grooved and Shouldered Joints.
- R. AWWA C900 – Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 -inch Through 12 -inch for Water Distribution.
- S. AWWA C901 – Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ -inch Through 3 -inch for Water Services.
- T. AWWA C905 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 -inch through 48 -inch (350 mm Through 1,200 mm) for Water Transmission and Distribution.
- U. AWWA C906 – Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4-inch Through 63 -inch, for Water Distribution
- V. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- W. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
- X. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- Y. ASTM D3139 - Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.

Z. ASME/ANSI B 31.3 – 1996 – ASME Code for Pressure Piping.

AA. ASME/ANSI B 16.9 – Pipe Fittings.

#### 1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide data on pipe fittings, valves, and accessories.

C. Manufacturer's Certificate: Certify that pipe, fittings, and valves meet or exceed respective ANSI, AWWA, and/or NSF Standards.

#### 1.05 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of piping mains, valves, connections, and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

#### 1.06 QUALITY ASSURANCE

A. Perform Work in accordance with the County Standards where applicable and not specified in these specifications.

B. Fabricated piping shall meet all ASME code requirements as specified here-in.

C. Valves: Manufacturer's name and pressure rating marked on valve body.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store valves in shipping containers with labeling in place.

### PART 2 PRODUCTS

#### 2.01 GENERAL

Although they may not be specifically shown on the drawings or called for elsewhere in the Technical Provisions, the Contractor shall include the cost of all fittings, piping supports, and miscellaneous appurtenances needed to provide a secure, fully restrained, workable pipe and valve system.

#### 2.02 APPROVED PRODUCTS

All products which are installed within the Palm Beach County right-of-way or will owned and maintained by the Palm Beach County Water Utilities Department shall be as

specified by the latest edition of the Palm Beach County Water Utilities Department Minimum Engineering and Construction Standards Potable Water, Reclaimed Water, and Wastewater Systems.

## 2.03 DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fittings for water service for 12 inches and under shall be Class 52 and pipes larger than 12 inches shall be Class 51 and conform to AWWA C110, C111, C115, C150, C151 and C153.
  - 1. Joints: Buried pipe shall be AWWA approved push-on or mechanical joint pipe (AWWA/ANSI C111/C21.11). Provide MJ Field-Lok gaskets or approved equivalent on all MJ DIP pipe joints. All gaskets are to be manufactured from EPDM.
  - 2. Aboveground joints or as shown on the drawings shall be flanged joints and shall be ANSI 21.20 and AWWA C110. Flanged gaskets shall be Toruseal gaskets as manufactured by American Ductile Iron Company and manufactured from EPDM. All hardware, bolts, washers, nuts, and etc. shall be 316 stainless steel.
  - 3. Fittings: Buried fittings shall be AWWA approved mechanical joint fittings, and conform to AWWA C110. Provide flanged fittings where shown on the plans and they shall be AWWA approved and conform to AWWA C110.
  - 4. The internal surface of all piping and fittings shall be cement mortar lined and seal coated in accordance with AWWA C104, A21.
  - 5. Do not exceed 80% of the pipe manufacturer's maximum rate of deflection per joint.
- B. DIP (Wastewater)
  - 1. Ductile iron pipe and fittings for 12 inches and under shall be Class 52 and pipes larger than 12 inches shall be Class 51 and conform to AWWA C110, C111, C115, C150, C151 and C153. Flanged ductile iron pipe shall be Class 53.
  - 2. Joints: Buried pipe shall be AWWA approved push-on or mechanical joint pipe (AWWA/ANSI C111/C21.11). Provide MJ Field-Lok gaskets or approved equivalent on all MJ DIP pipe joints. All gaskets are to be manufactured from EPDM.
  - 3. Aboveground joints or as shown on the drawings shall be flanged joints and shall be ANSI 21.20 and AWWA C110. Flanged gaskets shall be Toruseal gaskets as manufactured by American Ductile Iron Company and manufactured from EPDM. All hardware, bolts, washers, nuts, and etc. shall be 316 stainless steel.

4. Fittings: Buried fittings shall be AWWA approved mechanical joint fittings, and conform to AWWA C110. Provide flanged fittings where shown on the plans and they shall be AWWA approved and conform to AWWA C110.
5. Do not exceed 80% of the pipe manufacturer's maximum rate of deflection per joint.
6. Interior Coating
  - a. The interior of ductile iron pipe and fittings 4-inches and larger shall be lined with Protecto 401, Permox CTF, or approved equal.
  - b. All surfaces which are to be lined shall be cleaned to a minimum near white metal finish (SSPC-SP 10) as applied to ductile iron pipe and fittings. Surfaces shall be completely free of moisture, dust, grease and other deleterious substances at the time the lining is applied.
  - c. The coating thickness of internal linings shall be a nominal 40 mils and a minimum of 35 mils thick.
  - d. The coating thickness on sealing areas in the bell socket interior and on the spigot end of the pipe exterior shall be 6 mils nominal with a maximum of 10 mils. The joint shall be coated with an approved polyurethane coating material which has been tested and found to be compatible with the polyurethane lining.
7. Exterior Coating
  - a. The exterior of ductile iron pipe and fittings shall be painted with a green stripe.

## 2.04 DUCTILE IRON FITTINGS

- A. All fittings shall conform to ANSI/AWWA C110. All mechanical joint fittings shall incorporate joint restraint. Mechanical joint restraint shall be incorporated in the design of the follower gland, with low alloy steel tee head bolts and hex nuts. The restraint mechanism shall consist of a plurality of individually activated gripping surfaces to maximize restraint capability. Glands shall be manufactured of ductile-iron conforming to ASTM A536-80. The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA A21.11/C111 and ANSI/AWWA A21.53/C110 of the latest revision. Twist-off nuts, sized same as tee-head bolts, and shall be used to insure proper actuating of restraining devices. The restraint for PVC piping shall be Series 2000PV by EBAA Iron, Inc. or approved equal. The restraint for ductile iron piping shall be MEGALUG® by EBAA Iron, Inc. or approved equal.
- B. All ductile iron fittings shall be factory lined and coated as follows:

1. Wastewater – Lining: All interior fittings shall be Protecto 401 or Permox CTF applied in a single coat with a minimum of 35 mil dry film thickness.

## 2.05 SCHEDULE PVC PIPE AND FITTINGS

### A. PIPE

1. Pipe shall be schedule 80, type 1, grade 1 (Class 12454-B), conforming to ASTM D 1784.

### B. NIPPLES

1. Short nipples shall be the same as the PVC pipe.

### C. FITTINGS

1. Fittings shall be Schedule 80 and shall conform to ASTM D 2464 for threaded fittings and ASTM D 2467 for socket type fittings.

### D. FLANGES

1. Flanges shall be made of the same material as the pipe. Flange bolt pattern shall match the dimensions of ANSI B16.5, ASTM D 1784. Flanges shall be flat face. Flanges shall be van-stone style.
2. Flanged gaskets shall be Toruseal gaskets as manufactured by American Ductile Iron Company and manufactured from EPDM. All hardware, bolts, washers, nuts, and etc. shall be 316 stainless steel. Provide washers for each nut, washer material shall be of same material as the nut.

### E. JOINTS

1. Pipe and fitting joints shall be socket welded except where flange joints are required to connect to valves and equipment.
2. Solvent cement for socket flanges shall comply with ASTM F 493 and be NSF listed for potable water. Solvent Cement shall be Weld-On 724 Industrial Grade. Primer shall be Weld-On P-70.

## 2.06 GATE VALVES

- A. Resilient wedge gate valves shall be non-rising stem (NRS) type, conforming to the latest revision of AWWA Standard C-515. The body shall be of ductile iron and fully encapsulated inside and outside with a fusion bonded epoxy coating conforming to the latest revision of AWWA Standard C-550. The wedge shall be ductile iron and completely encapsulated with a resilient EPDM elastomer permanently bonded to the wedge and have a rubber-tearing bond that meets ASTM D429. The stem shall be cast bronze and have an integral thrust collar with a Delrin thrust bearing above and below the collar. The gate valve shall

have two O-rings set in machined grooves in the seal plate. The stem seal plate shall have an O-ring gasket to seal against the bonnet secured with bolts and nuts. The body, bonnet, and seal plate shall have a factory-applied thermoplastic epoxy coating on all interior and exterior surfaces. All internal parts shall be accessible for repair or maintenance without removing the body from the line.

1. Valves for buried service shall be complete with a cast bronze 2" operating nut that is independent of the stem and wedge. A geared side-mounted actuator with 2" operating shall be used where a top mount operator will not have adequate cover. Contractor to confirm prior to ordering valve.
2. Valves for above ground service shall be complete with a ductile iron handwheel.
3. Valve shall manufactured by American Flow Control, Clow Corporation, M&H Valve Company, US Pipe & Hydrant, or Mueller Company.

## 2.07 AIR RELEASE VALVE

- A. Air Release Valves shall be the type to automatically exhaust large quantities of air during filling and pressure conditions. Air release valve shall be equipped with a check valve on the discharge to prevent air from entering the system.
- B. Valve shall be with 2" N.P.T. threaded inlet as specified on the plans and 1-1/2" outlet. The valve body shall be 316 stainless steel. The float, debris screen, and diaphragm holder shall be Derlin (Polyoxymethylene). The diaphragm O-ring, seat, and damper ring shall be EPDM. Assembly nuts and bolts shall be 316 stainless steel, and eye bolt not required. Valve shall be equipped with a 1" 316 stainless steel ball valve capable of flushing the body of the valve. Outlet elbow to be polyethylene.
- C. Valve shall be the Model 989 Automatic Air and Vacuum Valve Stainless Steel 316Ti by H-Tec, or approved equivalent.

## 2.08 STAINLESS STEEL CHECK VALVES

- A. Check valves shall be swing type with female NPT threaded connection style. Body, disc, and seal material shall be 316 stainless steel. Check valves will feature a removable cap that provides easy access to internal components for maintenance. Minimum check valve opening pressure shall be 0.5 psi. 2" and 3" stainless steel check valves to be High-Flow Threaded Check Valve part number 46635K by McMaster-Carr or approved equal.

## 2.09 STAINLESS STEEL BALL VALVES

- A. Ball valves shall be 2-piece full port ball valves constructed of 316 stainless steel. Valves shall be manufactured by Neles/Jamesbury, FNW, Sanitube, or approved equal. Size shall be as called for on the construction drawings.

## 2.10 THRUST RESTRAINT

- A. All bends, tees, crosses, reducers and dead ends (fittings) shall be restrained through an approved means of mechanical joint restraint. All branch valves shall be restrained with MEGALUGS or approved equal or anchor tees. Thrust restraints shall be placed in accordance with the detail shown in the construction plans, and as necessary to provide a fully restrained piping system for the encountered soil conditions.

#### 2.11 CORPORATION STOPS

See Approved Material List as per the Palm Beach County Water Utilities Department Minimum Engineering and Construction Standards Potable Water, Reclaimed Water, and Wastewater Systems.

#### 2.12 TAPPING SLEEVE AND VALVE

See Approved Material List as per the Palm Beach County Water Utilities Department Minimum Engineering and Construction Standards Potable Water, Reclaimed Water, and Wastewater Systems.

#### 2.13 TAPPING SADDLE

See Approved Material List as per the Palm Beach County Water Utilities Department Minimum Engineering and Construction Standards Potable Water, Reclaimed Water, and Wastewater Systems.

#### 2.14 REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY

See Approved Material List as per the Palm Beach County Water Utilities Department Minimum Engineering and Construction Standards Potable Water, Reclaimed Water, and Wastewater Systems.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Verify that building service connection and municipal utility water main size, location and invert are as indicated.

#### 3.02 PREPARATION

- A. Where applicable, ream pipe and tube ends and remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

#### 3.03 SURFACE CONDITIONS

- A. Inspection

1. Prior to all Work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this work may properly commence.
  2. Verify that all equipment may be installed in accordance with all pertinent codes and regulations, the original design, shop drawings, and the reference standards.
- B. Discrepancies
1. In the event of discrepancy, immediately notify the Engineer.
  2. Do not proceed with installation in area of discrepancy until all such discrepancies have been fully resolved.

### 3.04 PIPE INSTALLATION - GENERAL

- A. Take all precautions necessary to insure that pipe, valves, fittings, and other accessories are not damaged in unloading, handling, and installation. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged material.
- B. Exercise care to keep foreign material and dirt from entering pipe during storage handling and installation. Close ends of in-place at the end of any work period to preclude the entry of animals and foreign material.
- C. Use only those tools specifically intended for cutting the size and material and type pipe involved. Make cut to prevent damage to pipe or lining and to leave a smooth end at right angles to the axis of the pipe.

### 3.05 THRUST RESTRAINT

- A. Provide reaction anchors of concrete blocking, metal harness, retainer gland type or restrained joint type at all changes in direction of pressure pipelines and as shown on drawings.
- B. Concrete reaction anchors shall bear against undisturbed earth and shall be of the size and shape necessary to resist service conditions of the pipe.
- C. Use metal harness restraints as shown on drawings.
- D. Where retainer glands are used, extreme care shall be taken so that each set screw is tightened as recommended by the manufacturer before the pipe is backfilled and tested. Retainer glands shall not be used on non-metallic pipe, or on any pipe 10-inch or smaller.

### 3.06 PRESSURE TESTING AND DISINFECTION

- A. Flush, test, and disinfect system in accordance with Section 02670.

### 3.07 FIELD QUALITY CONTROL

- A. Compaction testing shall be performed in accordance with Section 02200.
- B. If tests indicate Work does not meet specified requirements, remove work, replace, and retest at no cost to City.

### 3.08 GRAVITY WASTEWATER COLLECTION SYSTEM TESTING

All sewers shall be tested utilizing the two types of tests below.

- A. Mandrel Test Pipe deflection shall not exceed 5% measured by a go/no-go gauge or mandrel. The Engineer may confirm the pipe deflection at the end of the job prior to acceptance. Additionally, the Engineer may confirm the pipe deflection just prior to the end of the one year guarantee period. Pipe sections exceeding 5% long term deflection will be relaid by the Contractor at his own cost and expense and retested until the go/no-go gauge passes through the pipe section.

The mandrel will be considered the "official" gauge used for deflection testing. The standard gauge is manufactured by "HURCO" Technologies, Inc., Harrisburg, S.D. and shall be supplied by the contractor. The outside diameter of the mandrel is as follows:

Pipe Diameter (Inches)	Mandrel Diameter (Inches)
8	7.28
10	9.08
12	10.79

- B. Hydraulic Infiltration/Exfiltration Test: All pipe shall be dewatered and tested to measure the infiltration for at least three (3) consecutive days. Test section shall be from manhole to manhole. Longer test sections may be used with the approval of the Engineer.

The amount of infiltration/exfiltration including manholes, "Y" branches and connections shall not exceed 10 gallons per inch diameter per mile of sewer per 24 hours.

For making the infiltration tests, underdrains, if used, shall be plugged, well points and other groundwater drainage shall be stopped to permit the groundwater to return to its normal level. Infiltration shall be measured by the use of weirs designed specifically for this purpose or other acceptable means approved by the Engineer. As required, suitable bulkheads shall be installed to permit the test of the sewer.

Note the Contractor may use a low pressure air test as per ASTM f-1417 as an option to the hydraulic infiltration/exfiltration leakage test for gravity lines.

END OF SECTION

## SECTION 16000

### ELECTRICAL GENERAL REQUIREMENTS

#### PART 1 GENERAL

##### 1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General Conditions, apply to all the Work specified in the Electrical 16000 Sections.

##### 1.02 LAWS, PERMITS, FEES AND NOTICES

- A. Secure and pay all permits, fees and licenses necessary for the proper execution of the Work. Submit all notices and comply with all laws, ordinances, rules and regulations of any public agency bearing on the Work. CONTRACTOR shall be licensed Electrical CONTRACTOR in the county of construction.

##### 1.03 DEPARTURES

- A. If any departures from the Contract drawings or specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the ENGINEER for advance written approval, prior to departure.

##### 1.04 GUARANTEES

- A. Furnish written guarantee covering all materials, workmanship, labor and equipment for a period of one (1) year from the date of acceptance as described in the Contract General Conditions.
- B. The CITY reserves the right to operate and use all materials and equipment failing to meet the requirements of the Contract documents until such unacceptable materials and equipment are replaced or repaired to the satisfaction of the ENGINEER.

##### 1.05 AS-BUILT INFORMATION

- A. A set of "red-lined" electrical drawings shall be carefully maintained at the job site. Actual conditions are to be put on the drawings in red on a daily basis so the drawings will continuously show locations and routes of cable trays, conduits, pull-boxes, circuit numbers, and other information required by the ENGINEER.

##### 1.06 JOB SITE VISIT

- A. Visit the project site before submitting a bid. Verify all dimensions shown and determine the characteristics of existing facilities which will

affect performance of the Work, but which may not be shown on drawings or described within these specifications.

#### 1.07 CLEANUP

- A. Maintain a continuous cleanup during the progress of the Work and use appointed storage areas for supplies. The premises shall be kept free from accumulations of waste materials and rubbish.

#### 1.08 CUTTING AND PATCHING

- A. Cut and prepare all openings, chases and trenches required for the installation of equipment and materials. Repair, remodel and finish in strict conformance with the quality of workmanship and materials in the surroundings. Obtain written permission from the ENGINEER for any alterations to structural members before proceeding.

#### 1.09 MAINTENANCE

- A. Render all necessary measures to ensure complete protection and maintenance of all systems, materials and equipment prior to final acceptance. Any materials or equipment not properly maintained or protected to assure a factory new condition at the time of final acceptance shall be replaced immediately at no additional cost to the CITY.

#### 1.10 WATERPROOFING

- A. Whenever any Work penetrates any waterproofing, seal and render the Work waterproof. All Work shall be accomplished so as not to void or diminish any waterproofing bond or guarantee.

#### 1.11 TESTS

- A. Conduct an operating test of equipment prior to the ENGINEER's approval. The equipment shall be demonstrated to operate in accordance with the requirements of these specifications. The tests shall be performed in the presence of the ENGINEER or an authorized representative. The electrical CONTRACTOR shall furnish all instruments, electricity and personnel required for the tests.

#### 1.12 SUMMARY OF ELECTRICAL WORK

- A. Provide all labor, materials, tools, supplies, equipment and temporary utilities to complete the Work shown on the drawings and specified herein. All systems are to be completely installed and fully operational. Specifically, the Work includes, but is not necessarily limited to the following:
  - 1. Provide coordination with power company and Telephone company provider for temporary and permanent power and phone service; see the drawings.

2. Provide and install all the electrical equipment, and field instrumentation for proposed sewage pump station, pumps, terminal junction box, control panel, grounding, equipment racks and the like.
3. Provide new electrical service, metercan, main disconnect and equipment rack
6. Provide all programming and configuration of the VFD equipment and the Rayco Verbatim autodialer per Contract Documents.

#### 1.13 CODES AND STANDARDS

- A. General Applicable provisions of the following codes and standards and other codes and standards required by the State of Florida and local jurisdictions are hereby imposed on a general basis for electrical Work (in addition to specific applications specified by individual Work sections of these specifications):
  1. U.L.: Electrical materials shall be approved by Underwriters' Laboratories, Inc. This applies to materials which are covered by U.L. standards. Factory applied labels are required.
  2. National Electrical Code.
  3. OSHA: Standards of the Occupational Safety and Health Administration are to be complied with.
  4. NEMA: National Electrical Manufacturers Association Standards are to be met wherever standards have been established by that agency and proof is specifically required with material submittals for switchboards, motor control centers, panelboards, cable trays, motors, switches, circuit breakers and fuses.
  5. ANSI: America National Standards Institute
  6. NESC: National Electrical Safety Code
  7. Any and all local codes.

#### 1.14 ELECTRICAL TEMPORARY FACILITIES

- A. The electrical CONTRACTOR shall include in his bid the cost of furnishing, installing, maintaining and removing all materials and equipment required to provide temporary light and power to perform his Work during construction and until Work is completed.

B. Safety

1. All reasonable safety requirements shall be observed to protect workers and the public from shock and fire hazards. Ground fault interrupters shall be employed in accordance with codes.
2. Ground wires are required in all circuits. Ground poles are required on all outlets. All metallic cases shall be grounded.
3. Raintight cabinets shall be used for all equipment employed in wet areas.

1.15 EXCAVATING FOR ELECTRICAL WORK

A. General – Not needed

1.16 ELECTRICAL SUBMITTALS

A. Submittals for Approval

1. Refer to Contract General Conditions for additional instructions on the General Conditions and this section, the more stringent requirements shall apply.
2. Shop Drawings and Manufacturer's data sheets are required for all electrical materials.
3. Submittals will not be accepted for partial systems. Submit all materials for each specification section at one time. Submittals must be arranged, correlated, indexed and bound in orderly sets for ease of review.
4. Samples are to be supplied for any substitute as requested by the ENGINEER.
5. The following numbers of copies are required:

Shop drawings	6 sets
Samples	1 each
Manufacturer's data	6 sets
Certifications	6 sets
Test reports	6 sets
Warranties/Guarantees	6 sets

6. Submit shop drawings, Manufacturer's data and certifications on all items of electrical Work prior to the time such equipment and materials are to be ordered. Order no equipment or materials without approval from the ENGINEER. Submittals will not be accepted for partial system submittals; submit all data at one time. Submittals will be promptly returned, approved, approved as noted, or not approved. Items "approved as noted" must be changed to comply with the ENGINEER's

comments and need not be resubmitted for "approved" status. Items "not approved" are not suitable, requiring complete new submittals.

7. Time delays caused by rejection of submittals are not cause for extra charges to CITY or time extensions. CONTRACTOR shall be responsible for investigating existing systems or shop drawings in order to fully integrate the new equipment into the system. Adequate shop drawings may or may not exist for all existing systems.

B. Operation and Maintenance Manuals

1. Submit to the ENGINEER five (5) copies of all Manufacturer's service installation and operation manuals, instructions and bulletins. These manuals shall be subject to review of the ENGINEER. If acceptable they shall be forwarded to the CITY. If not acceptable they shall be returned to the CONTRACTOR for revision and resubmittal. Manuals shall contain, but not be limited to, the following:
  - a. Brief description of system and basic features.
  - b. Manufacturer's name and model number for all components in the system.
  - c. List of local factory authorized service companies.
  - d. Operating instructions.
  - e. Maintenance instructions
  - f. Trouble shooting instructions
  - g. Manufacturer's literature describing each piece of equipment.
  - h. Power and control wiring diagrams
  - i. Parts lists

1.17 ELECTRICAL PRODUCTS

A. Standards Products

1. Unless otherwise indicated in writing by the ENGINEER, the products to be furnished under this specification shall be the Manufacturer's latest design. Units of equipment and components of the same purpose and rating shall be interchangeable throughout the project. All products shall be newly manufactured. Defective equipment or equipment damaged in the course of installation or test, shall be replaced

or repaired in a manner meeting with the approval of the ENGINEER at no additional expense to the CITY.

B. Delivery, Storage and Handling

1. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identification; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the Manufacturer specifically for exterior instructions for storage locations.

C. Substitutions

1. Comply with instructions in the Contract General Conditions and Special Conditions and obtain pre-approval of the ENGINEER regarding substitutions.

1.18 SKILLED ELECTRICAL CRAFTSMEN

- A. CONTRACTOR shall employ and staff the project with skilled Craftsmen experienced in the project requirements.
- B. As a minimum, a Licensed Journeyman Electrician shall be present on the project at all times.
- C. Other skilled persons shall be present as the project requirements dictate including Manufacturers representatives, start-up technicians, ENGINEERs, etc.

1.19 DRAWINGS AND SPECIFICATIONS

- A. Refer to the drawings for additional requirements. There are requirements indicated on the drawings which are not indicated in the specification.
- B. Bidders, suppliers, equipment vendors, General CONTRACTOR, Sub Contractors and other similar entities are required to read all the Contract documents including drawings and specifications.

1.20 SCHEMATIC NATURE

- A. Plan views are schematic in nature and meant to show the schematic arrangement of equipment and conduit.
- B. CONTRACTOR shall provide the CITY/ENGINEER with an 11 x 17 (min) drawing (to scale) of the final layout of the equipment and conduit routing for approval. This drawing shall include measurements for all NEC required clearances and separations for equipment and conduit. Refer to other spec sections for conduit routing requirements.

#### 1.21 APPROVED SHOP DRAWINGS

- A. Use approved shop drawings for lay out of equipment. The Contract documents will vary from the shop drawings. Inform the ENGINEER immediately if there are lay out issues or inadequate space for equipment or clearances. Land conduits in openings of enclosures per the approved shop drawings, do not use the Contract drawings.
- B. Housekeeping pads, equipment racks and the like shall be based on the approved shop drawings.

#### 1.22 CLEARANCES

- A. It shall be the CONTRACTOR's responsibility to meet N.E.C. clearances about equipment.

#### 1.23 ROUTING

- A. Conduit routing is schematic in nature. Conduit routing is shown for clarity on the Contract drawings. See other spec sections for additional conduit routing requirements.

#### 1.24 FUTURE FACILITIES

- A. Where future facilities are indicated, conduit routing shall account for such facilities.

#### 1.25 DRAWINGS FURNISHED BY CONTRACTOR

- A. CITY shall be provided all CONTRACTOR furnished drawings. Such drawings include, but are not limited to: Control panels, MCC.s, switch boards, instrumentation details, redline mark-up of the Contract drawing and the like.
- B. Drawings shall be furnished for review and approval. No materials shall be provided without the ENGINEER's approval.
- C. Final drawings shall be furnished or as field modified accounting for any changes made during start up.

#### 1.26 HOMERUNS

- A. CONTRACTOR shall coordinate home runs between plan views. Where any conduit is shown in any plan view it shall be installed the entire length may be required.

#### PART 2 PRODUCTS (NOT USED)

#### PART 3 EXECUTION (NOT USED)

END OF SECTION

144086023  
16000-7

## SECTION 16050

### BASIC MATERIALS AND METHODS

#### PART 1 GENERAL

##### 1.01 SUBMITTALS

- A. Submit data sheets on all items per Section 16000.

##### 1.02 CODES AND STANDARDS

- A. General applicable provisions of the following codes and standards and other codes and standards required by the State of Florida and local jurisdictions are hereby imposed on a general basis for electrical Work (in addition to specific applications specified by individual Work sections of these specifications):
  - 1. U.L.: Electrical materials shall be approved by the Underwriters' Laboratories, Inc. This applies to materials which are covered by U.L. standards. Factory applied labels are required.
  - 2. NEC: National Electrical Code
  - 3. OSHA: Standard of the Occupational Safety and Health Administration are to be complied with.
  - 4. NEMA: National Electrical Manufacturers Association Standards are to be met wherever standards have been established by that agency, and proof is specifically required with material submittals for switchboards, motor control centers, panelboards, cable trays, motors, switches, circuit breakers, and fuses.
  - 5. ANSI: American National Standards Institute
  - 6. NESC: National Electrical Safety Code

#### PART 2 PRODUCTS

##### 2.01 GROUNDING MATERIALS

- A. All ground rods shall be 20 foot 5/8" copperclad, unless otherwise indicated.
- B. Around wires shall be soft drawn copper sized per National Electrical Code, unless otherwise indicated.

## 2.02 CONDUIT

### A. PVC Conduit

1. PVC conduit shall be Schedule 80 or Schedule 40 unless otherwise noted and shall be U.L. approved. Comply with Federal Spec WC-1094 and NEMA TC-1.

### B. Flexible Conduit

1. All flexible conduits shall be liquidtight, made of corrosion resistant plated steel with extruded polyvinyl covering and watertight connectors.

### C. Refer to schedule in drawing for location requirements.

## 2.03 CABLE, WIRE AND CONNECTORS

### A. 600 Volt Power Wiring

1. Individual conductors shall be rated for 600 volts and shall meet the requirements below:
  - a. Conductors shall be stranded.
  - b. All wire shall be brought to the job in unbroken packages and shall bear the date of manufacturing; not older than 12 months.
  - c. Type of wire shall be THWN except where required otherwise by the Contract drawings.
  - d. No wire smaller than No. 12 gauge shall be used unless specifically indicated.
  - e. Conductor metal shall be copper.
  - f. All conductors shall be meggered after installation. Megger testing shall exceed 50 mega ohms.
2. Multi-conductor cables shall be type TC UL 1277 THWN, PVC jacketed 600V with conductor and quantities as indicated.

### B. Instrumentation and Control Cable

1. Process instrumentation wire shall be 16 gauge twisted pair, 600 V., aluminum tape shielded, polyvinyl chloride jacketed, as manufactured by the American Insulated Wire Co., Eaton Corp., or

equal. Multiconductor cables with individually shielded twisted pairs shall be installed where indicated.

2. Multiconductor control cable shall be stranded 14 gauge, 600 V. THWN insulated overall shielded with PVC jacket, as manufactured by the American Insulated Wire Co., Eaton Corp., or equal.

#### 2.04 TERMINATIONS AND SPLICES (600 VOLTS AND LESS)

- A. Terminations of power cable shall be by means of U.L. approved connectors. All connectors shall meet U.L. 486B and shall be compatible with the conductor material.
- B. Terminate all control and instrumentation cable with screw-clamp type terminal blocks.
- C. Splicing of power, control, or instrumentation wiring will not be allowed except by written approval of the ENGINEER. Where splicing is allowed, splices shall be made with approved compression connectors, and splices shall be made waterproof regardless of location.

#### 2.05 BOXES

- A. Boxes for wiring devices, switches and receptacles installed outdoors shall be weatherproof fiberglass with polycarbonate cover plates.

#### 2.06 PULL BOXES AND SPLICE BOXES

- A. Location
  1. Units used outdoor or in a damp or corrosive environment shall be 316 ss or fiberglass unless otherwise indicated on plans.
  2. Units used indoors in dry and clean A/C environments shall be NEMA 1.
- B. Size
  1. Units shall be sized per NEC as minimum.
- C. Required Units
  1. Plans depict minimum requirements. Additional units shall be provided as may be required to complete raceway systems.

#### 2.07 MOUNTING AND SUPPORTING ELECTRICAL EQUIPMENT

- A. Furnish and install all supports, hangers, and inserts required to mount fixtures, conduits, cables, pull boxes, and other equipment.

- B. Support system used indoors in clean, dry and air conditioned areas shall be galvanized steel. All other areas shall be 316 ss with ss fasteners.
- C. Perforated straps and wires are not permitted for supporting electrical devices. Anchors shall be of approved types.
- D. All supports, hangers, hardware, etc. used outdoors or in in non-air conditioned indoor areas or in hazardous areas shall be non-ferrous, corrosion resistant or 316 stainless steel. Supports shall be selected to avoid galvanic reactions. Support devices shall be submitted for approval.
- E. Provide trapeze, bridge systems or wall bracketed cantilevered system to support the raceway system.
- F. Spacing of support systems shall be per NEC. Provide spacing of conduits according to the NEC and the materials used. For PVC conduit, refer to NEC table 347-8.
- G. Plans depict minimum requirements. Provide additional units as required to complete raceway system.

## 2.08 DUCT SEAL

- A. Provide Garvin Industries' duct seal or an approved equal
- B. Provide and install duct seal at all conduit ends for all new conduit installations.
- C. Duct seal shall be used to seal around junction boxes, control panels and the like. It shall be a permanently soft, non toxic compound. It shall also not affect other plastic materials or corrode metals.
- D. Duct seal shall be applied to the control panel conduit penetrations, disconnects, and the like. Apply to each penetration but not more than 20-2" conduits per panel.

## PART 3 EXECUTION

### 3.01 GROUNDING

- A. Provide ground system as indicated on the drawings and as required by the National Electrical Code.
- B. All raceways require grounding conductors. Metallic raceways are not adequate grounding paths. Bonding conductors through the raceway systems shall be continuous from main switch ground buses to panel ground bars of the panelboards, and from panel grounding bars of panelboards and motor control centers to branch circuit outlets, motors,

lights, etc. THESE GROUND CONDUCTORS ARE REQUIRED THROUGHOUT THE PROJEC REGARDLESS OF WHETHER CONDUIT RUNS SHOW GROUND CONDUCTORS ON THE DRAWINGS.

- C. All connections made below grade shall be of the exothermic type.
- D. The grounding system test shall not exceed a 48 hour span dry resistance of 10 ohms. Additional grounding to meet this requirement shall be installed at no extra cost. Grounding and bonding connections shall not be painted.

### 3.02 CONDUIT

#### A. Locations:

Conduits shall be used as follows:

1. Refer to schedule on drawings.

#### B. Installation

1. Conduits subjected to rough handling or usage shall be removed from the premises.
2. Conduits must be kept dry and free of water or debris with approved pipe plugs or caps. Care shall be given that plugs or caps be installed before pouring of concrete.
3. Where conduits pass through exterior concrete walls or fittings below grade, the entrances shall be made watertight.
4. Infurred ceilings, conduit runs shall be supported from structure, not furring.
5. Conduits entering panelboards, pull boxes, or outlet boxes shall be secured in place by galvanized locknuts and bushings, one (1) locknut outside and one (1) locknut inside of box with bushing on conduit end. The locknuts shall be tightened against the box without deforming the box. Bushings shall be of the insulating type.
6. Field conduit bends shall be made with standard tools and equipment manufactured especially for conduit bending.
7. Where embedded conduits cross expansion joints, furnish and install offset expansion joints or sliding expansion joints. Sliding expansion joints shall be made with straps and clamps.
8. Exposed runs of conduits shall be installed with runs parallel or perpendicular to walls, structural members or intersections of

vertical planes and ceilings, with right angle turns consisting of symmetrical bends. No attempts are made in plans to show required pull boxes, gutters, etc. necessary for the construction of the raceway system but the CONTRACTOR shall provide these raceways as may be required.

9. Conduits in structural slabs shall be placed between the upper and the lower layers of reinforcing steel, requiring careful bending of conduits. Conduits embedded in concrete slabs shall be spaced not less than eight (8) inches on centers or as widely spaced as possible where they converge at panels or junction boxes. Conduits running parallel to slab supports, such as beams, columns and structural walls shall be installed not less than 12 inches from such supporting elements. To prevent displacement during concrete pour, saddle supports for conduit, outlet boxes, junction boxes, inserts, etc., shall be secured.
10. Conduit runs shall always be concealed except where indicated on plans.
11. Pull lines shall be installed in all empty conduits. All pull wires shall be identified with conduit number at each end.
12. Where conduits are run individually, they shall be supported by approved pipe straps secured by means of toggle bolts or tapcons on hollow masonry; tapcons on concrete or solid masonry; machine screws or bolts on metal surfaces and wood screws on wood construction. The use of perforated straps or wires will not be permitted.
13. Wire shall not be installed until all Work of any nature that may cause damage is completed, including pouring of concrete. Mechanical means shall not be used in pulling in wires No. 8 or smaller.
14. Underground conduits not under concrete slabs are to be buried at least two (2) feet below finished grade for circuits rated 600 volts or less, except under traffic areas where motor vehicles may cross. Under traffic areas, conduits are to be buried at least three (3) feet below finished grade.
15. All conduits shall be cleaned by pulling a brush swab through before installing cables.
16. All conduits shall be sealed at each end with electrical putty. Special care shall be taken at all equipment where entrance of moisture could be detrimental to equipment. Approved backing gauze is required prior to the installation of conduit putty.

17. A maximum of two (2) feet of flexible conduit shall be used at connections of all motors, transformers, motor operated valve and gates, instruments and other items of equipment where vibration is present. It shall be supported where required with stainless steel bands.
20. PVC conduit shall be supported to walls and slabs using carlon snap strap conduit wall hangers. Two hole PVC conduit clamps shall not be permitted.

### 3.03 WIRES, CABLES AND CONNECTIONS

- A. Cables pulled into conduits shall be pulled using pulling eyes attached to conductors.
- B. Shields shall be grounded at only one termination point.

### 3.04 BOXES

- A. Installation of boxes shall be in accordance with the National Electrical Code requirements.
- B. Boxes shall be mounted plumb and level in accessible locations and mounting shall be secure, vibration resistant and galvanically compatible. Hardware shall be used that is specifically intended for the purpose. When mounted in corrosive, damp or wet locations, stainless steel hardware shall be utilized.

### 3.05 WIRING DEVICES

- A. Wiring devices shall be installed in device boxes approved for the application. All connections shall be made with screw terminals. Wiring devices shall be Leviton or approved equal.
- B. Wire devices on UPS systems shall be isolated ground, colored orange.
- C. Cover plates shall be provided as follows except as otherwise noted.
  1. Interior finished area – brushed aluminum
  2. Wet areas – gasketed plastic with flip cover.
- D. Receptacles installed outdoors, below grade, or in areas other than clean and dry environments shall be GFI and weatherproof. Receptacles shall be weatherproof with cords plugged in.
- E. All receptacles shall be GFI protected.

### 3.06 SUPPORTING DEVICES

- A. All items shall be supported from the structural portion of the building and studs, except standard ceiling mounted lighting fixtures and small devices may be supported from ceiling system where permitted by the ENGINEER. However, no sagging of the ceiling will be permitted. Supports and hangers shall be types approved by Underwriters' Laboratories.
- B. All floor-mounted devices (switchboards, motor control centers, transformers, etc.) shall be securely anchored to the floors. Where recommendations are made by Manufacturer, these recommendations shall be followed.

### 3.07 CLEANING

- A. All electrical equipment enclosures shall be thoroughly cleaned before acceptable by the CITY. As a minimum, CONTRACTOR shall remove all debris including stripped wire insulation, dirt, and debris.

END OF SECTION

## SECTION 16900

### CONTROL PANELS

#### PART 1 – GENERAL

##### 1.1 SCOPE OF WORK

- A. The Contractor shall furnish, install and place into service operating process instrumentation, control systems and control panels including accessories, related to wastewater control panels as shown on plans and specified herein.
- B. Coordinate with the pump vendor, and other trades and Contractors, and equipment vendors to provide a complete and operational instrumentation and control system.
- C. The Instrumentation and Controls Contractor is ultimately responsible to make the control panels operate per the Contract Documents and the City's latest standards; at minimum this shall include for the I&C Contractor to provide all additional hardware, materials, field modifications, and labor as required.
- D. Drawings depict the best available data from the City's latest standards; the control panel schematics reflect the City's intent of the pump operation, the I&C Contractor shall provide all additional relay logic, pilot devices and labor to properly implement the City's intent of the pump operation.

##### 1.2 SINGLE INSTRUMENT SUPPLIER

- A. The Contractor shall assign to the Single Instrument and Control (I&C) supplier full responsibility for the functional operation of all new instrumentation systems. The Contractor shall have said supplier perform all engineering necessary to select, to furnish, to supervise installation, connection, to calibrate, to place into operation all sensors, instruments, alarm equipment, control panels, accessories and all other equipment as specified herein.
- B. The foregoing shall enable the Contractor and the City to be assured that the full responsibility for the requirements of this section shall reside in an organization which is qualified and experienced in the waste water treatment field and its process technology on a functional system basis.
- C. The I&C supplier shall be a UL 508, UL 698A listed manufacturer. Acceptable named manufacturers shall be limited to the following:
  - 1. C.C. Control
  - 2. DCR Engineering

3. Rocha Controls.
- D. Contractor shall review all specifications and drawings.
1. The following are the suggested division of responsibilities. The Contractor shall have the freedom and responsibility to complete the work in any fashion he sees fit as long as the following minimum features are included.
  2. The control panel manufacturer shall provide all of the control panel equipment including starters, pilot lights, switches, relays, pump controller, terminal strips field instruments, and the like. The control panel manufacturer shall configure the autodialer equipment and program it to call out via telephone assigned phone numbers of City's troubleshooting technicians. List of phone number and names to be furnished during startup.
  3. All field located instrumentation and control equipment shall be provided by the I&C Contractor. Such equipment shall include floats, level probes, and the like.
  4. Detailed shop drawings shall be prepared and submitted by the control panel manufacturer to the Engineer. Before the submittal is made to the Engineer, the I&C Contractor shall work out all the details with the other system vendors.

### 1.3 INSTALLATION WORK

- A. Nothing in this part of the specifications shall be construed as requiring the Contractor to utilize personnel supplied by his assigned instrument manufacturer's organization or any division thereof, to accomplish the physical installation of any elements, instruments, accessories or assemblies specified herein. However, the Contractor shall employ installers who are skilled and experienced in the installation and connection of all elements, instruments, accessories and assemblies; portions of their work shall be supervised or checked as specified herein.

### 1.4 PREPARATION OF SUBMITTAL OF DRAWINGS AND DATA

- A. It is incumbent upon the Contractor to coordinate the work specified in these Sections so that a complete instrumentation and control will be provided and will be supported by accurate shop and record drawings. As part of the responsibility as assigned by the Contractor, the Single I&C supplier shall prepare and submit through the Contractor, complete and organized shop drawings, as specified herein. Interface between instruments, motor starters, flow meters, and existing instruments shall be included in his shop drawing submittal.
- B. In order to provide a fully coordinated system, shop drawings by other equipment vendors associated with the I&C control panel systems shall

be reviewed and approved by the Contractor before submittal to the Engineer for approval.

- C. During the period of preparation of this submittal, the Contractor shall authorize direct informal liaison between his single I&C Supplier and the Engineer for exchange of technical information. As a result of this liaison certain minor refinements and revisions in the systems as specified may be authorized informally by the Engineer, but these shall not alter the scope of the work or cause increase or decrease in the contract price. During this informal exchange no oral statement by the Engineer shall be construed to give formal approval of any component or method, nor shall any statement be construed to grant formal exception to, or variation from these specifications.

D. Operation and Maintenance Manual

- 1. Submit one preliminary O&M for review and comment by the Engineer. Provide five final O&M.s, bound in a three ring binder. O&M shall include the requirements of I&C materials and minimally include the following: approved submittal data, start-up corrected as built shop drawings. O&M shall be neatly and logically arranged with a contents page followed by tabbed sections.

1.5 ADDITIONAL TECHNICAL SERVICES

- A. At no additional cost to the City, the Contractor shall provide the services of qualified technical representatives of the Single I&C supplier:
  - 1. To supervise installation and connection of all instruments, elements and components of every system, including connection of instrument signals to primary measurement elements and to final control elements such as pumps.
  - 2. To make all necessary adjustments, calibrations, field modifications, and tests;
  - 3. To instruct plant operating and maintenance personnel on instrumentation. This time shall be in addition to whatever time is required for other facets of work at the site and shall be during the City's normal working days and hours.

1.6 GUARANTEE

- A. The Contractor shall guarantee all equipment and installation, as specified herein, for a period of one (1) year following the date of completion of the work. To fulfill this obligation, the Contractor shall utilize technical service personnel designated by the Single I&C supplier to which the Contractor originally assigned project responsibility for instrumentation.

## 1.7 ADDITIONAL PROVISIONS

- A. The applicable provisions of the following sections under Electrical Work shall apply the work and equipment specified herein, the same as if stated in full herein:
  - 1. Codes and Standards
  - 2. Equipment Materials and Workmanship
  - 3. Testing
  - 4. Grounding
  - 5. Equipment Anchoring
  - 6. Conductor and Equipment Identification
  - 7. Terminal Cabinets and Control Compartments
  - 8. Process Control Devices

## 1.8 NEWEST MODEL COMPONENTS

- A. All meters, instruments and other components shall be the most recent field proven models marketed by their manufacturers at the time of the submittal of shop drawings unless otherwise specified to match existing equipment. All technical data publications included with the submittal shall be the most recent issue.

## 1.9 COORDINATION

- A. I&C supplier shall coordinate with his supplier and other Contractors on the project. Where large subsystems are provided, the I&C supplier shall coordinate before the bid to be certain all equipment, engineering and labor are provided. Coordination item minimally includes: equipment dimensions, heat rejection, power requirements, control and signal requirements, and interconnection requirements.

## 1.10 TEST PROCEDURE DEVELOPMENT AND DOCUMENTATION

- A. I&C subcontractor shall prepare and submit to the Engineer for review a detailed description of the test procedures that he proposed to perform to demonstrate conformance of the complete system of instrumentation and controls to this Specification.
- B. It is recommended that the I&C subcontractor develop the test procedures in two steps by first submitting general descriptions and outlines of the tests and then, upon receipt of approval, submit the required detailed procedures and forms.

C. Operational Acceptance Tests

1. The I&C subcontractor shall prepare check-off sheet(s) for each loop and an instrument calibration sheet for each active I&C element (except simple hand switches, lights, etc.). These check-off and data sheets shall form the basis for these operational tests and this documentation.
2. Each loop check-off sheet shall cite the following information and shall provide spaces for sign-off on individual items and on the completed loop by the I&C subcontractor.
  - a. Project name
  - b. Loop number
  - c. For each elements: Tag number, description, manufacturer and model number, installation bulletin, and Specification sheet number.
  - d. Loop description
  - e. Installation check
  - f. Termination check
  - g. Calibration check
  - h. Adjustment check
  - i. Space for comments
  - j. Space for loop sign-off I&C subcontractor and date.
3. Each instrument calibration sheet shall provide the following information and a space for sign-off on individual items and on the completed unit by City Representative and the I&C subcontractor.
  - a. Project name
  - b. Loop number
  - c. Tag number
  - d. Manufacturer
  - e. Model number
  - f. Serial number
  - g. Calibration range

- h. Calibration data: Input, output and error at 0, 25, 50, 75, and 100% of span.
- i. Switch setting, contact action and dead band for discrete elements.
- j. Space for comments
- k. Space for sign-off by I&C subcontractor and date.

D. Functional Acceptance Tests

The I&C subcontractor shall prepare two types of test forms as follows:

1. For those functions that can be demonstrated on a loop-by-loop basis, the form shall include:
  - a. Project name
  - b. Loop number
  - c. Loop description
  - d. Test procedure description
  - e. For each component: Tag number, description, manufacturer and data sheet number.
  - f. Space for sign-off and date by both I&C subcontractor and City Representative.
2. For those functions that cannot be demonstrated on a loop-by-loop basis, the test form shall be a listing of the specific tests to be conducted. With each test description, the following information shall be included:
  - a. Spec page and paragraph of function demonstrated
  - b. Description of function
  - c. Space for sign-off and date by both I&C subcontractor and Engineer.

## PART 2 – PRODUCTS

### 2.1 INSTRUMENTATION CRITERIA

A. Designation of Components

1. In these specifications and on the drawings, all systems, meters, instruments and other elements are represented schematically, and are designated by numbers, as derived from criteria in Instrument Society of America Standard ANSI/ISA S5.1-1973. The nomenclature and numbers designated herein and on the drawings shall be employed exclusively throughout shop drawing, data sheets and similar materials. Any other symbols, nomenclature unique to the manufacturer's standard methods shall not replace these prescribed above, used herein and on the Drawings.

B. Signal Characteristics

1. Signals shall be electrical, as indicated herein, and shall vary in direct linear proportion to the measured variable, except as noted. Electrical signals outside control panels shall be 4-20MADC, except as noted.

C. Matching Style, Appearance and Type

1. All instruments to be panel mounted at the control panels shall have matching style and general appearance. Instruments performing similar functions shall be of the same type, model, or class and shall be one (1) manufacturer.

D. Accuracy and Repeatability

1. The overall accuracy of each instrumentation system or loop shall be as prescribed in the specifications for that system or loop. Each system's accuracy shall be determined as a probable maximum error; this shall be the square root of the sum of the squares of the certified "accuracies" of certain designated components in each system, expressed as a percentage of the actual span or value of the measured variable. Each individual electronic instrument shall have a minimum accuracy of +0.7 percent of full scale and a minimum repeatability of +0.4 percent of full scale unless otherwise specified. Instruments which do not conform or improve upon these criteria are not acceptable.

E. Signal Isolators, Converters and Power Supplies

1. Signal isolators shall be furnished and installed in each measurement and control loop, wherever required, to assure adjacent component impedance match or where feedback paths may be generated. Signal converters shall be included where required to resolve any signal level incompatibilities. Signal power supplies shall be included, as required by the manufacturer's instrument load characteristics, to insure sufficient power to each loop component.

F. Alternative Equipment or Methods

1. Equipment or methods requiring redesign of any project details are not acceptable without prior written approval of the Engineer. Any changes inherent to a proposal alternative shall be at no additional cost to the City. The required approval shall be obtained in writing by the I&C subcontractor through the Contractor prior to submittal of shop drawings and data. Any proposal for approval of alternative equipment or method specified, shall include evidence of improved performance, operational advantage and maintenance enhancement over the equipment or method specified, or shall include evidences that a specified component is not available. Otherwise, alternative equipment (other than direct, equivalent substitutions) and alternative methods shall not be proposed.

G. Special Equipment

1. The I&C Supplier shall provide all necessary equipment to properly interface his system with equipment provided by others. Such equipment shall include but not be limited to special sensing relays for seal failures and the like.

2.2 DETAILED SYSTEMS DRAWINGS AND DATA

A. Content

The Contractor shall submit detailed shop drawings and data prepared and organized by the Single I&C supplier designated at the time of bidding. The quantity of submitted sets shall be no less than 6 sets. These drawings and data shall be submitted as a complete bound package at one time within 30 calendar days after date of notice to proceed.

1. Drawings showing definite diagrams for every instrumentation loop system shall be provided. These diagrams shall show and identify each component of each loop or system using legend and symbols from ISA standard S5.4, each having the format of ISA Standard S5.1 as used on the project drawings.
2. Coordinate all equipment and instrument tags with the Engineer and the City.
3. Data sheets for each component, together with a technical product brochure or bulletin shall be provided. The data sheets shall show:
  - a. Component function description used herein and on the drawings;

- b. Manufacturer's model number or other product designation;
  - c. Project tag number used herein and on the drawings'
  - d. Project system loop of which the component is a part;
  - e. Project location or assembly at which the component is to be installed;
  - f. Input and output characteristics;
  - g. Scale range, units and multiplier;
  - h. Requirements for electrical supply;
  - i. Materials of component parts to be in contact with, or otherwise exposed to process media;
  - j. Special requirements or features.
4. A complete index shall appear in the front of each bound submittal volume. A separate technical brochure or bulleting shall be included with each instrument data sheet. The data sheet shall be indexed in the submittal by systems or loops, as a separate group for each system or loop. If, within a single system or loop, a single instrument is employed more than once, one data sheet with one brochure may cover all identical uses of that instrument in that system. Each brochure shall include a list of tag numbers for which it applies. System groups shall be separated by labeled tags.
5. Drawings shall show both schematic and wiring diagrams for control circuits. Complete details on the circuit interrelationship of all devices within and outside each control panel shall be submitted. Control devices and pertinent mechanical relationships including mechanical parameters shall be included on these diagrams. These parameters as a minimum shall include instrument ranges, sizes, setpoints and the like. The diagrams shall consist of component layout drawings to scale, showing numbered terminals on components together with the unique number of the wire to be connected to each terminal. Piping and wiring diagrams shall show terminal assignments from all primary measurement devices, such as flow meters, and to all final control devices, such as pumps. The Contractor shall furnish all necessary equipment supplier's shop drawings to facilitate inclusion of this information by the I&C system supplier.
6. Assembly and construction drawings for each control panel and for other special enclosed control assemblies for field installation shall be provided. These drawings shall include dimensions,

identification of all components, surface preparation and finish data, name plates and the like. These drawings also shall define exactly the style and overall appearance of the assembly; a final treatment sample shall be provided when requested.

7. Installation anchoring and mounting details for all components and assemblies to be field-mounted, including conduit connection or entry details shall be provided.
8. Complete detailed bill of materials including a master bill of materials listing all field mounted devices, control panels and other equipment that will be shipped to the job site and a bill of materials for each control panel listing all devices within the panel.

B. Organization and Binding

1. The organization of the original shop drawing submittal shall be compatible to the eventual inclusion with the technical manuals submittal and shall include final alternations reflecting "as built" conditions. Accordingly, the initial multiple copy shop drawing shall be separately bound in 3-ring binders.

## 2.3 TECHNICAL MANUALS

- A. One preliminary O&M manual shall be submitted to the Engineer for review and comment. Assuming a favorable review the I&C supplier shall incorporate comments and forward the five final copies to the Engineer. If the preliminary O&M is not acceptable, the I&C supplier shall resubmit.
- B. Five (5) final sets of technical manuals shall be supplied for the City as a condition for final acceptance of the project. Each set shall consist of one (1) or more volumes, each of which shall be bound in a standard size, 3-ring, loose leaf, vinyl plastic hard cover binder suitable for bookshelf storage. Binder ring size shall not exceed 3 inches.
- C. In addition to updated shop drawing information to reflect actual existing conditions, each set of technical manuals shall include installation, connection, operating, trouble-shooting, maintenance and overhaul instructions in complete detail. This shall provide the City with comprehensive information on all systems and components to enable operation, service, maintenance and repair. Exploded or other detailed views of all instruments, assemblies, and accessory components shall be included together with the complete parts lists and ordering instructions.
- D. Shop drawing files shall be provided in the latest version of Autocad with each O&M manual. Provide electronic copy of the files on CD ROM disk.

## 2.4 SPARE PARTS

- A. The Contractor shall include, as part of the bid package, a list of recommended spare parts covering items required under these specifications.
- B. Minimum spare parts shall be provided boxed and identified including the following:
  - 1. 2-control relays of each type used.
  - 2. 2-timing relays of each type used.
  - 3. 4-fuses of each size and type used.
  - 4. 4-pilot lights of each size and type use.
  - 5. 2-signal field surge arrester of each type used.
  - 6. 2-signal panel surge arrester of each type used.
  - 7. 2-incoming power lightning arrester of each type used.
  - 8. 2-surge capacitor of each type used.

Also provide other spares as noted by the particular sections and paragraphs of other- specifications.

## 2.5 CONTROL PANELS

- A. General
  - 1. I&C supplier shall construct the control panel to properly control internal and external equipment. No attempt is made to specify or indicate on plans, all required equipment but rather to set forth the minimum requirements.
- B. Engineering
  - 1. I&C supplier shall provide system engineering and produce detailed fully engineered, coordinated and completed drawings.
- C. Construction
  - 1. Control panel construction shall be per these specification and plans.
- D. Signal and Control Circuit Wiring
  - 1. Wire Type and Sizes: Conductors shall be flexible stranded copper wire; these shall be UL listed TFFN, THWN, THHN and

shall be rated 600v. Wire for control signal circuits shall be #16 AWG unless otherwise noted. All instrumentation cables shall be shielded #18 AWG with a copper drain wire unless otherwise noted. All special instrumentation cable such as between sensor and transmitter shall be supplied by the I&C supplier. Contractor shall increase wire size per load or impedance requirements.

E. Wiring Instrumentation

1. All wires shall be run in plastic wireways except (1) field wiring, (2) wiring between mating blocks in adjacent sections, (3) wiring run from components on a swing-out panel to components on a part of the fixed structure, (4) wiring run to panel mounted components on the door and the like. Wiring run on a swing out panel to other components on a fixed panel shall be made up in nylon wire ties bundles and secured so that bundles are not strained at the terminals.
2. Wiring run to control devices on the front panels shall be tied together at short intervals with nylon ties and secured to the inside face of the panel using adhesive mounts and adhesive strips.
3. Wiring to rear terminals on panel mounted instruments shall be run in plastic wares secured to horizontal brackets run above or below the instruments in the same plane as the rear of the instruments.
4. Shields of instrument cable shall only be grounded on one side of each circuit. The side to be grounded shall be nearest the source of excitation.
5. Care shall be exercised to properly insulate the ungrounded side of the loop to prevent ground loops from occurring.
6. Conformance to the above wiring installation requirements shall be reflected by details shown on the shop drawings for the Engineer's review.

F. Wire Marking

1. Each signal, alarm, control, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number which shall be shown on all shop drawings. These numbers shall be marked on all conductors using white plastic heatshrink sleeves with typewritten characters. Instrument signal conductors shall be tagged with unique multiple digit numbers. Wires from the circuit breaker panelboard shall be tagged indicating the branch circuit breaker number.

G. Terminal Blocks

1. Compression type terminal blocks shall be molded plastic with barriers and box lug terminals, and shall be rated 15 amps at 600v and mounted securely to DIN rails. White marking strips fastened to the molded sections shall be provided and wire numbers and circuit identifications shall be marked thereon with machine printed marker on top. Terminal blocks shall be IEC style by Entrelec M4/6 or an approved equal.

H. Wire Color

1. Wire color shall be, Line Power – Black; Neutral or common – White; AC Control – Red; DC Control – Blue; Equipment or Chassis Ground – Green; specified externally powered circuits – Orange.

I. Enclosures

1. Unless otherwise indicated, all enclosures L 24" x W 24" and larger shall be provided with the following.
  - a. NEMA 4X, all materials 316 ss, freestanding or rack mounted, bolted to concrete base outside door stop, drip shield, provide cut in bottom for conduit penetration.
  - b. Subplate for mounting equipment.
  - c. Padlockable, pocketed exterior doors.
  - d. Where required, provide stainless steel piano hinged dead fronts with quarter turn latches.

J. Identification

1. All components shall be identified using Lamicoid labels or an approved equal.

2.6 CONTROL PANEL EQUIPMENT

A. General Purpose Relays

1. General purpose relays in the control panel shall be the plug in type with contacts rated 10 amps at 120 vac as a minimum. The quantity and type of contacts shall be as required to accomplish the desired control task. Each relay shall be enclosed in a clear plastic heat and shock resistant dust cover. Relays shall be Potter and Brumfield or an approved equal. Differing mounting sockets shall be used to prohibit improper relay installations. Provide tube type base, 8 PIN or 11 PIN. Blade type relays shall not be used.

B. Time Delay Relays

1. Time delay relay shall be Diversified with digital settings or an approved equal. Timers shall be time delay on, interval on or time delay off relays, as required and shall be Diversified or an approved equal. Instantaneous contacts or auxiliary slave relays shall be provided as required. Provide tube type base, 8 PIN or 11 PIN. Blade type relays shall not be used.

C. Signal Isolators

1. Additional slave or interposing relays and signal isolators and signal converters shall be installed as required.

D. Circuit Breakers

1. Circuit breakers shall be single pole, 120vac, 15 amp rating or as required to protect wires and equipment; mounted on the inside of the enclosure or equipment remote from the enclosure.

E. Name Plates

1. Name plates shall be supplied for identification of control panels and all field mounted elements, including flowmeters and their transmitters. These name plates shall identify the instrument or meter, descriptively as to the function of the system. Nameplates shall be fabricated from black faced, white centered, laminated engraving plastic. A nameplate shall be provided for each signal transducer, signal converter, signal isolator, each electronic trip, and the like, mounted inside the control panels. These shall uniquely identify each control component. Adhesives shall be acceptable for attaching nameplates. Painted surfaces must be prepared to allow permanent bonding of adhesives. Nameplates shall be provided for instruments, function titles for each group of instruments and other components mounted on the front of the control panels as shown. Proposed colors, styles, height and text shall be submitted for approval.

F. Fluorescent Light

1. Provide fluorescent panel light mounted to sub plate. Provide sub plate mounted switch and handy boy.

G. Vapor Guard

1. Moisture absorbing vapor guard shall be provided in each control panel.

H. Power Supplies

1. Power supplies shall be provided as required for loop power or other requirements for special equipment. Loop power supplies shall be Square D or an approved equal.

I. Circuit Breakers

1. Square D
2. Amperage ratings shall be indicated on drawings.

J. Fuses

1. Fuses and fuse holders 5x 20mm, IEC style, with blown fuse indicating light.

K. Ground Fault Interrupting Receptacle

1. Leviton Duplex Receptacle or equal.
2. AC receptacle box shall be Steel City 58351-1/2 or equal.
3. Covers shall be Steel City 58-C-5, or equal.

L. Selector Switches and Push Buttons

1. Square D, Class 9001, Type K, or equal.
2. Operators shall be black knob type or key switch, 3-position or 2-position, push button or as noted.
3. Selector switches shall be spring return where noted.
4. Pushbuttons inserts

	<u>Label</u>	<u>Color</u>
a.	On	Green
b.	Off	White
c.	Start	Green
d.	Stop	White
e.	Reset	Black
f.	Acknowledge	Yellow

5. Selector Switch Operator

	<u>Label</u>	<u>Color</u>	<u>Text</u>
a.	All	Black	White

M. Indicator Lights

1. Square D, Class 9001, type K. Units shall not be press to test or transformer type.
2. Lens color shall be as noted.

	<u>Label</u>	<u>Color</u>
a.	On	Green
b.	Off	White
c.	Open	Green
d.	Closed	White
e.	Hand	Yellow
f.	Auto	Green
g.	Local	White
h.	Remote	Green
i.	Alarm	Red

N. Surge and Lightning Arrestors

1. All control panels shall be provided with surge and lightning arrestors as specified.
2. TVSS
  - a. Lightning surge suppressors shall be SQ D.
3. Signal
  - a. Panel surge arrestors shall be Edco, HSP Series.
  - b. Field surge arrestors shall be Edco, TC642C Series.

O. Intrinsically Safe Relays

1. Units shall be Gems Safe Paks or equal.

P. Motor Ground Fault Monitors

1. Control Panel shall be provided with ground fault monitor at each pump motor power feeder. Monitor shall be capable of disabling each motor starting logic. Provide all additional logic and pilot devices required to stop motor starter in event of a ground fault in pump motor/pump motor cable. Refer to control panel schematic for details.

Q. Pump Vendor Protection Devices

1. Provide Flygt MiniCAS pump protective relays or equivalent for pump leakage and high temperature pump sensors.

2. Furnish additional wiring and pilot devices as required to implement MiniCAS protection into control panel logic.

R. Intrusion Alarm

1. Provide a panel intrusion alarm for the Control Panel.

S. Motor Starter

1. Refer to VFD – VFD equipment being used for single phase power from power company and output/convert to 3 phase power for 3 phase power pump motors.
2. Reset buttons as require.

T. VFD

1. Provide a 6 pulse VFD pump motor controller, SQ D or equal, with output filter and input line reactor. Units shall be provided to be used in outdoor enclosed panels and operate within the typical hot temperature of an outdoor enclosed control panel.
2. VFD equipment shall be UL listed as manufactured by SQ D, Yaskawa or approved equal.

2.7 FIELD INSTRUMENTATION AND CONTROL EQUIPMENT SPECIFICATIONS

A. General

1. The materials specified below shall establish the type and quality of materials used.
2. Refer to Civil, Mechanical, and Electrical drawings for additional requirements.

B. Floats

1. Provide non-mercury form “C” floats with cable lengths as required.
2. Anchor Scientific or equal.
3. Provide J-boxes for connection to conduit and wire systems.

2.8 NAMEPLATES, NAME TAGS AND SERVICE LEGENDS

- A. All components provided under this section, both field and panel mounted, shall be provided with permanently mounted name tags bearing the entire IA tag number of the components. Panel mounted tags shall be plastic; field mounted tags shall be stamped stainless steel.

- B. The panel drawings refer to nameplates and service legends: nameplates are defined as inscribed laminated plastic plates mounted under or near a panel face mounted instrument. Service legends are defined as inscribed laminated plastic integrally mounted on a panel face mounted instrument.
- C. Service legends and nameplates shall be engraved, rigid, laminated plastic. Service legends and nameplates shall be fastened to the panel by screws or with a specially applied adhesive. Fastening shall not depend only on the adhesive.

### PART 3 – EXECUTION

#### 3.1 INSTALLATION, CALIBRATION, TESTING, START UP AND INSTRUCTION

##### A. General

- 1. Under the supervision of a Single I&C supplier, all systems specified in this section shall be installed, connected, calibrated and tested and in coordination with the City and Engineer shall be started to place the process in operation. This shall include final calibration in concert with equipment specified elsewhere in these specifications as well as equipment provided by the City.

##### B. Installation and Connection

- 1. The Contractor shall install and connect all field mounted components and assemblies under the criteria imposed in 1.3, herein. The installation personnel shall be provided with a final reviewed copy of the shop drawings and data.
- 2. The instrument process lines, impulse piping lines and air signal tubing shall, in general, be installed in a similar manner to the installation of conduit specified under Section 16000.
- 3. Bends shall be formed with the proper tools and to uniform radii and shall be made without deforming or thinning the walls of the tubing.
  - a. Unless otherwise indicated, all fittings, adapters, impulse piping, valves, etc. shall be 316 stainless. Valves shall be Whitey Series 40 or an approved equal.
- 4. The Contractor shall have a technical field representative of the I&C supplier to instruct these installation personnel on any and all installation requirements; thereafter the technical field representatives shall be readily available by telephone to answer questions and to provide clarification when needed by installation personnel.

- a. Where primary elements (supplied by the I&C supplier) will be part of a mechanical system, the I&C supplier shall coordinate the installation of the primary elements with the mechanical system manufacturer.
5. After all installation and connection work has been completed, the technical field representatives shall check all for correctness, verifying polarity of electric power and signal connections making sure all process connections are free of leaks and all such similar details. The technical field representative shall certify in writing to the Contractor that for each loop or system he has completed such check out and that any discrepancies have been corrected by the installation personnel.
6. The field representative of the I&C supplier shall coordinate all work required to interface the new equipment, including all required modifications to the existing equipment and related devices.

C. Calibration

1. All new instruments shall be calibrated.
  - a. All instruments and systems shall be calibrated after installation, in accordance with the component manufacturer's written instructions. This shall provide that those components having adjustable features are set carefully for the specific conditions and applications of this installation and that the components and/or systems are within the specified limits of accuracy. Defective elements which cannot achieve proper calibration or accuracy, either individually or within the system shall be replaced. This calibration work shall be accomplished by the I&C Supplier.
  - b. Proof of Conformance – The burden of proof of conformance to the specified accuracy and performance is on the Contractor using his designated I&C supplier. The Contractor shall supply necessary test equipment and technical personnel if called upon to prove accuracy and performance at no additional cost to the City, wherever reasonable doubt or evidence of malfunction or poor performance may appear within the guarantee period.

D. Testing

1. All systems shall be exercised through operational tests in the presence of the Engineer in order to demonstrate achievement of the specified performance. Operational tests depend upon completion of work specified elsewhere in these specifications. The scheduling of the test shall be coordinated by the Contractor

among all parties involved so that the tests may proceed without delays or disruption by incomplete work.

2. All functional/loop tests shall be witnessed and signed off by the City's representative and the I&C subcontractor.
3. Contractor shall provide testing service in conjunction testing the autodialer equipment. Contractor shall include a maximum of 4 man hours for this service. If problems are found as a result of I&C equipment additional time shall be provided as may be required at no cost to the City

E. Training

1. City's technical/electrical operating personnel shall be provided with training prior to start-up.
2. One 8 hour training sessions shall be provided. Training shall be at a time convenient to the City.
3. Operating and maintenance personnel shall be instructed in the functions and operation of each system and shall be shown the various adjustable and set point features which may require readjustment, resetting or checking, recalibration or maintenance by them from time to time. This instruction shall be scheduled at a time arranged with the City at least two (2) weeks in advance. Instruction shall be given by qualified persons employed by the I&C supplier.

F. Start Up

1. When all systems are assessed by the Contractor to have been successfully carried through complete operational tests with a minimum of simulation, and the Engineer concurs in his assessment, startup may follow.
2. The Contractor shall demonstrate to the City and the Engineer the pump down operation and the control panel operation during the startup phase.

END OF SECTION

# APPENDIX A

## GEOTECHNICAL ENGINEERING STUDY



July 2, 2020

Kimley-Horn  
1920 Wekiva Way  
Suite 200  
West Palm Beach, FL 33411  
Attn: Mr. Jason Lee  
email: [jason.lee@kimley-horn.com](mailto:jason.lee@kimley-horn.com)

Re: Geotechnical Engineering Study  
Belle Glade State Municipal Airport  
Water Lift Station  
Palm Beach County, Florida  
TSF File No. 7111-20-190

Dear Jason:

**TIERRA SOUTH FLORIDA, INC. (TSF)** is pleased to present the results of Geotechnical Engineering Study Report for the referenced project. This report includes the results of field exploration and geotechnical recommendations for proposed project, as well as general site development.

### **EXECUTIVE SUMMARY**

A geotechnical exploration and evaluation of the subsurface conditions have been completed for the proposed Lift Station in Belle Glade, Florida. In general, beneath the topsoil, the subsurface conditions consisted of the near-surface layer of dark brown organic silty sand with trace limerock, with a USCS Classification of SM; OL, with an organic content of approximately 10 percent. The organic layer exists in the uppermost 2 feet of depth. A light brown sandy limestone layer exists beneath the upper organic layer to the termination depth of the borings. The groundwater was not encountered in the upper 4 feet of soil. Drilling fluid was required to drill below the uppermost 4 feet, preventing an accurate estimate of the groundwater level. Based on our experience in this area, we expect the groundwater to be encountered between approximately 4 feet and 7 feet below the existing ground surface. For design purposes, the groundwater should be assumed to be at the ground surface.

A matt foundation can be designed to be supported on the sandy limestone with an allowable bearing capacity of 4,100 pounds per square foot. **The Contractor shall anticipate difficult Lift Station installation due to the presence of limestone. The presence of difficult soil conditions may occur at varying depths below the ground, including boulder-like materials.**

The owner/designer should not rely solely on this Executive Summary and must read and evaluate the entire contents of this report before utilizing our engineering recommendations in preparation of design/construction documents.

## **PROJECT INFORMATION**

### **Project Authorization**

TSF has completed a geotechnical exploration for the proposed Lift Station at the Belle Glade State Municipal Airport, in Palm Beach County, Florida. Our services were authorized by Kimley-Horn.

### **Project Description**

Review of the "Soil Survey of Palm Beach County, Florida", prepared by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), indicates the site is mapped as noted below. A copy of the USDA Soil Survey Map is attached to this report as **Soil Map - Palm Beach County, Florida**.

#### **Map Unit 26 - Pahokee muck, drained, frequently ponded, 0 to 1 percent slopes**

The Pahokee, drained component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over limestone. Depth to a root restrictive layer, bedrock, lithic, is 36 to 51 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 75 percent.

Our understanding of the project is based on information provided by the Kimley-Horn. The project will consist of constructing a Lift Station. The project is located at the Belle Glade State Municipal Airport, in Palm Beach, Florida. It is our understanding that grades will not be raised relative to existing grades.

The geotechnical recommendations presented in this report are based on the available project information, building location, and the subsurface materials described in this report. If any of the noted information is incorrect, please inform TSF in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. TSF will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

### **Purpose and Scope of Services**

The purpose of this study was to explore the subsurface conditions at the site to enable an evaluation of acceptable construction and site development considerations.

Our scope of services included the drilling of one (1) Standard Penetration Test (SPT) boring to a depth of 30 feet below existing grade for the Lift Station and the preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommended soil parameters.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air on or below, or around this site. Any statements in this report regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes. Before further development of this site, an environmental assessment is advisable.

## **SUBSURFACE CONDITIONS**

### **Subsurface Conditions**

Our subsurface investigation consisted of drilling of one (1) Standard Penetration Test (SPT) boring to a depth of 30 feet below the existing grade for the Lift Station. Boring location was selected by Kimley-Horn and was located in the field by TSF personnel by tape measurements using site features as reference. The attached Boring Location Plan, Sheet 1, includes the approximate location of the boring.

The SPT boring was drilled using a truck-mounted CME-45 drill rig, and mud rotary and casing procedures. Samples of the in-place materials were recovered at frequent intervals using a standard split spoon driven with a 140-pound hammer freely falling 30 inches (the SPT sampling after ASTM D 1586). The samples of the in-place soils were returned to our laboratory for classification by a geotechnical engineer. The samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D 2488). A limited amount of laboratory testing was completed to substantiate the visual classification. **A Summary of Laboratory Test Results** is attached.

In general, beneath the topsoil, the subsurface conditions consisted of a near-surface layer of dark brown organic silty sand with trace limerock, with a USCS Classification of SM; OL, with an organic content of approximately 10 percent. The organic layer exists in the uppermost 2 feet of depth. A light brown sandy limestone layer exists beneath the upper organic layer to the termination depth of the borings. Based on the SPT N-Values, the surficial 2 feet is in loose-density conditions, followed by a 2 foot layer in the very-dense-density condition, with the remainder of the boring depth in the medium-density condition.

The above subsurface description is of a generalized nature intended to highlight the major subsurface stratification features and material characteristics. The boring log should be reviewed for specific information at the boring location. These records include soil descriptions, stratifications, and penetration resistances. The stratifications shown on the boring log represent the conditions only at

the actual boring location. Variations may occur and should be expected. The stratifications represent the approximate boundary between subsurface materials, and the actual transition may be gradual. Water level information obtained during field operations is also shown on the boring logs. The samples that were not altered by laboratory testing will be retained for 30 days from the date of this report and then will be discarded.

### **Groundwater Information**

The groundwater was not encountered in the upper 4 feet of exploration. Drilling fluid was required to drill below the uppermost 4 feet, preventing an accurate estimate of the groundwater level. Based on our experience in this area, we expect the groundwater to be encountered between approximately 4 feet and 7 feet below the existing ground surface. For design purposes, the groundwater should be assumed to be at the ground surface. The soil profiles are presented on the attached **Boring Location Plan and Soil Profiles**. Groundwater levels are expected to fluctuate with seasonal fluctuations. We expect the groundwater to, typically, fluctuate within approximately 2 ft from where it is estimated to exist. At this time, information is not available to assess if groundwater will impact the proposed foundation construction.

In general, the seasonal high groundwater level is not intended to define a limit or ensure that future seasonal fluctuations in groundwater levels will not exceed the estimated levels. Post-development groundwater levels could exceed the normal seasonal high groundwater level estimate as a result of a series of rainfall events, changing conditions at the site that alter surface water drainage characteristics, or variations in the duration, intensity, or total volume of rainfall. We recommend that the Contractor determine the actual groundwater levels at the time of the construction to determine groundwater impact on his or her construction procedures.

## **EVALUATION AND RECOMMENDATIONS**

### **Geotechnical Discussion**

The geotechnical study completed for the proposed lift station confirms that the site is suitable for the planned construction when viewed from a soil mechanics and foundation engineering perspective. Subsurface conditions at the site are not expected to impose any major geotechnical constraints or limitations on the proposed construction.

The Lift Station can be supported on a mat foundation system bearing on the natural sandy limestone. Proper shoring and dewatering may be required depending on the type of construction methodology selected. Densification of the surficial soils of the site will be needed to increase the shear strength and reduce foundation and slab settlements to tolerable values.

Recommendations for site preparation, foundation design, and the related construction are presented in the following sections of this report.

### **Foundation Recommendations**

Based on the data currently available, the planned Lift Station can be supported on a mat foundation bearing on the natural sandy limestone. The mat foundation bearing on limestone should be designed and proportioned for a maximum bearing pressure of 4,100 pounds per square foot (psf). **The structure should be designed and installed to prevent buoyancy.**

Excavating equipment may disturb the granular bearing soil in foundation areas. The upper 12 inches of foundation bottom soils should be compacted to achieve not less than 95 percent of the maximum dry density, as determined by ASTM D 1557, immediately before reinforcing and concrete placement. The footings will likely require shoring or temporary retaining systems to maintain the stability of nearby soils.

The foundation excavations should be observed by a representative of TSF before steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Loose soil zones encountered at the bottom of the footing excavations should be adequately compacted to the aforementioned 95% criteria.

### **Excavations**

**The Contractor shall anticipate difficult Lift Station installation due to the presence of limestone. The presence of difficult soil conditions may occur at varying depths below the ground, including boulder-like materials. The Contractor shall anticipate potential cave-in of the sandy soils and limestone. The Contractor shall take steps to mitigate the difficult Lift Station installation through the use of specialized equipment and procedures. All costs for labor, materials, equipment and incidentals necessary to mitigate the difficult Lift Station foundation installation shall be incidental to the pay item of the structure for which the Lift Station foundation is required.**

Subsoils found at the site consist primarily of sandy limestone. Specialty equipment will be required to excavate the limestone. Unsuitable material or organic soils encountered should be removed and replaced with structural fill.

We expect that unbraced cut slopes made in the granular soils at an inclination of 1.7 horizontal to 1 vertical will remain stable for short periods of time provided they are not subjected to seepage, surcharge loads (e.g., from stockpiled soil or equipment) and excessive vibration. Furthermore, open-cut excavations exceeding 10 feet in depth should be properly dewatered and sloped 2H:1V or flatter or be benched using a bracing plan approved by a professional engineer licensed in the State of Florida. Excavated materials should not be stockpiled at the top of the slope within a horizontal distance equal to the excavation depth.

Dewatering will be required for in-the-dry construction over those sections of the site where the elevations of the structure fall below the water table. If the draw down requirements is greater than 1 foot, well point dewatering may be required.

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P." This document was issued to better ensure the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely adhered, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain the stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. TSF is not assuming responsibility for the construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

### **Lateral Earth Pressures**

Below-grade structures should be designed to resist earth pressure from granular backfill, surcharge loads, and unbalanced hydrostatic forces. For walls that are not restrained during backfilling but are free to rotate at the top, active earth pressure should be used in the design. Walls that are restrained should be designed assuming at-rest earth pressure. In cases where the wall moves into the backfill, passive earth pressure criteria should be used. Recommended equivalent fluid densities for each pressure condition **with no allowance for surcharge loads** are presented below in Table 1.

<b>Table 1 - Lateral Earth Pressure Coefficients</b> <b>Based on 105 pcf Saturated Unit Weight Based on 105 pcf Saturated Unit Weight</b>			
Mode	Symbol	Coefficient	Below Water Pressure (pcf)*
Active	K <sub>a</sub>	0.33	77
At Rest	K <sub>0</sub>	0.5	84
Passive	K <sub>p</sub>	3.00	192
* Includes the water pressure weight. All components should be designed for submerged conditions.			

Where possible, we recommend that a drainage system be provided behind the structure to relieve hydrostatic pressure. A coefficient of sliding friction of 0.35 is recommended.

### **OTHER CONSIDERATIONS**

#### **Preconstruction Conditions Survey**

A preconstruction conditions survey should be performed before any construction at the site. The preconstruction conditions survey will involve visually inspecting and videotape documenting the adjacent structures; photographing observable existing cracks, deterioration, or other signs of distress. The preconstruction conditions survey will provide valuable information of the existing conditions of the structures adjacent to the proposed development. It would serve as a qualitative record document of the existing conditions of the adjacent structures before the start of the construction.

### **REPORT LIMITATIONS**

The recommendations submitted are based on the available subsurface information obtained by TSF and project information furnished by the Kimley-Horn. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, TSF should be notified immediately to determine if changes in the recommendations are required. If TSF is not retained to perform these functions, TSF will not be responsible for the impact of those conditions of the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

This report has been prepared for the exclusive use of the Kimley-Horn for the specific application to the proposed Lift Station at Belle Glade Sate Municipal Airport in Palm Beach County, Florida.

If you have any questions about this report, or as we may be of further service, please contact our office.

Respectfully submitted,

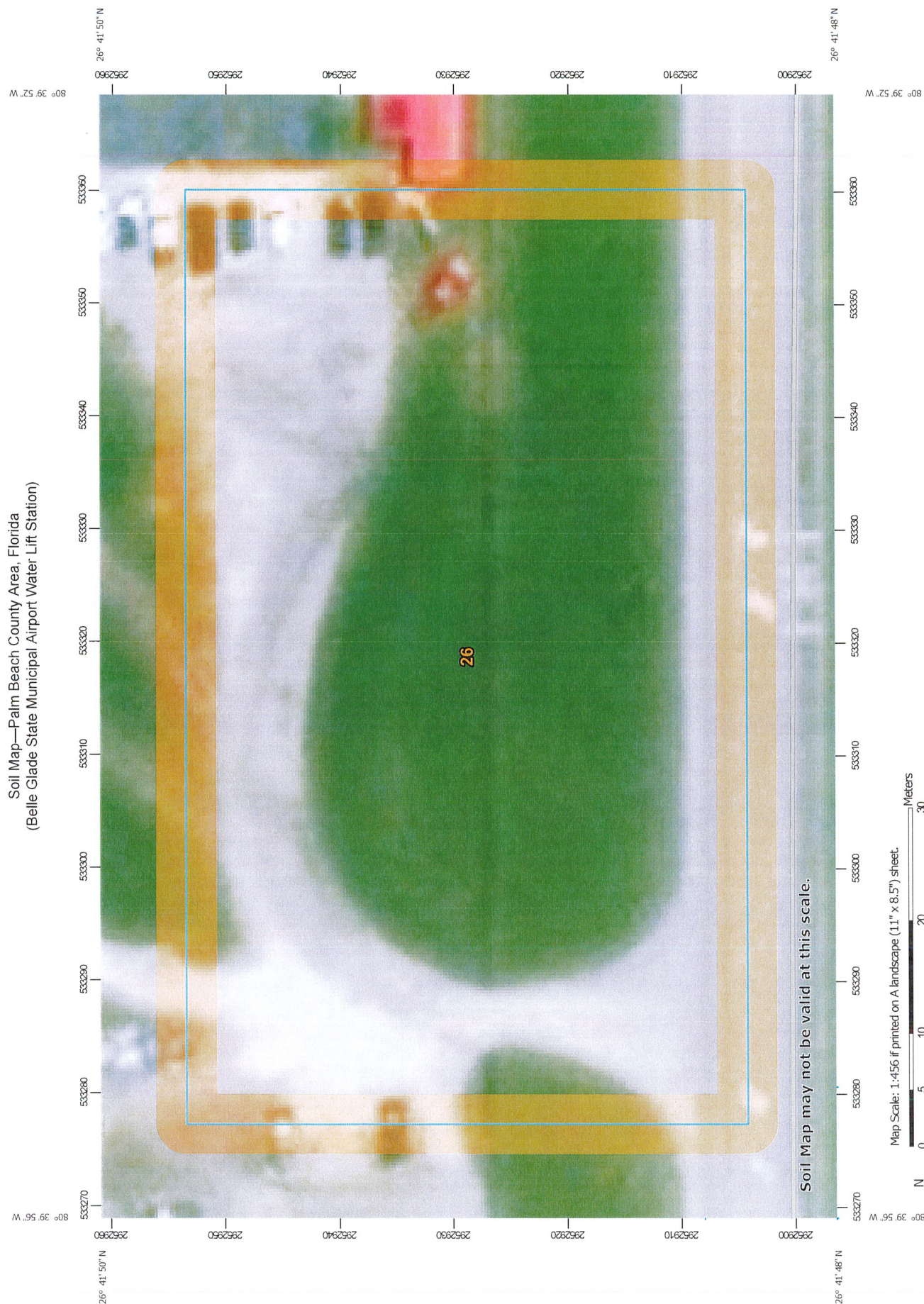
**TIERRA SOUTH FLORIDA, INC.**

Harmon C. Bennett, P.E.  
Principal Engineer  
FL Reg. No. 53130

Ramakumar Vedula, P.E.  
Principal Engineer  
FL Reg No. 54873

Attachments: SOIL MAP - PALM BEACH COUNTY AREA, FLORIDA  
SUMMARY OF LABORATORY TEST RESULTS  
BORING LOCATION PLAN AND SOIL PROFILES – SHEETS 1









Soil Map—Palm Beach County Area, Florida  
(Belle Glade State Municipal Airport Water Lift Station)



Map Scale: 1:456 if printed on A landscape (11" x 8.5") sheet.



## MAP LEGEND

<b>Area of Interest (AOI)</b>		Area of Interest (AOI)		Spill Area
<b>Soils</b>		Soil Map Unit Polygons		Stony Spot
		Soil Map Unit Lines		Very Stony Spot
		Soil Map Unit Points		Wet Spot
<b>Special Point Features</b>		Blowout		Other
		Borrow Pit		Special Line Features
		Clay Spot		
		Closed Depression		
		Gravel Pit		
		Gravelly Spot		
		Landfill		
		Lava Flow		
		Marsh or swamp		
		Mine or Quarry		
		Miscellaneous Water		
		Perennial Water		
		Rock Outcrop		
		Saline Spot		
		Sandy Spot		
		Severely Eroded Spot		
		Sinkhole		
		Slide or Slip		
		Sodic Spot		

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Palm Beach County Area, Florida  
Survey Area Data: Version 16, Feb 3, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 8, 2013—Mar 20, 2017

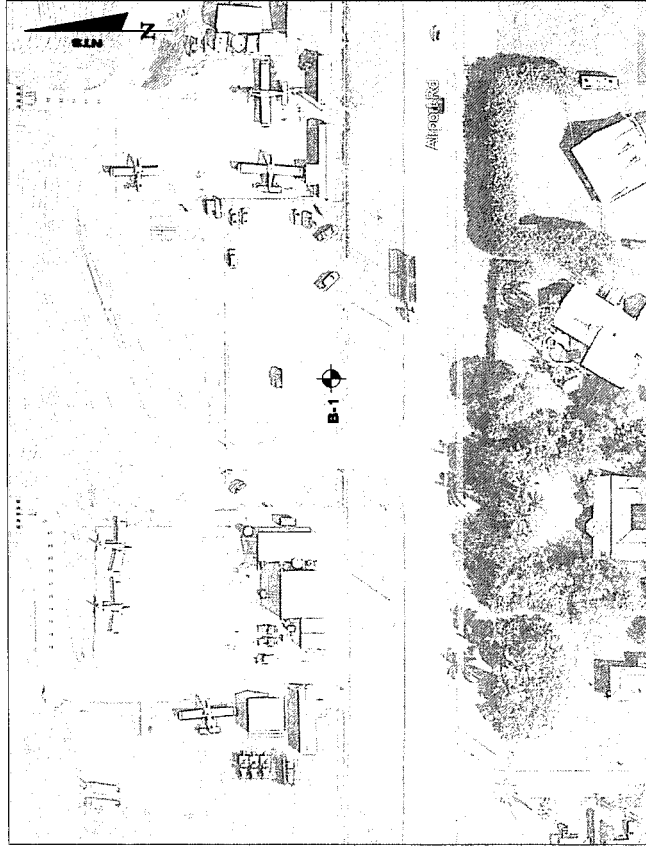
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26	Pahokee muck, drained, frequently ponded, 0 to 1 percent slopes	1.0	100.0%
Totals for Area of Interest		1.0	100.0%

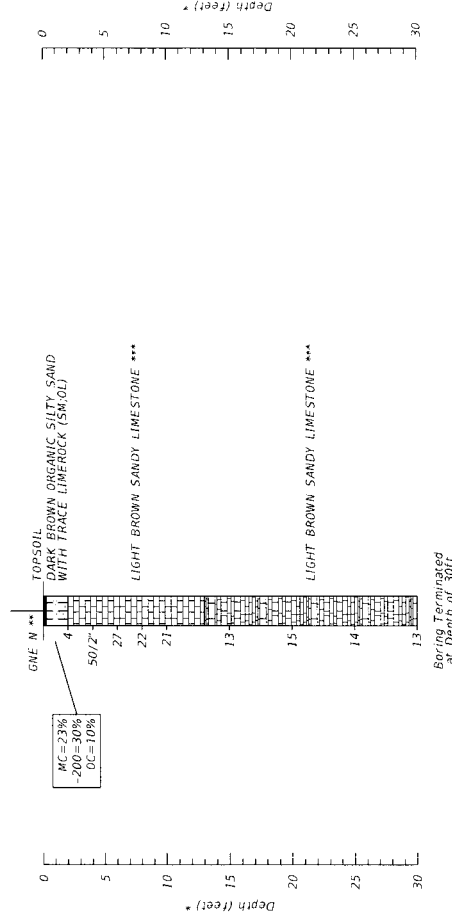


BOR # 6/18/2020  
GNE N  
HAMMER AUTO  
CME-45  
LATITUDE 28.65124  
LONGITUDE -80.65124



## BORINGS LOCATION PLAN

Approximate SPT Boring Location



### LEGEND

- Topsoil
- Silty Sand
- Limestone Hard
- Limestone Soft

### ENCOUNTERED GROUNDWATER TABLE

GNE GROUNDWATER NOT ENCOUNTERED, DRILLING FLUID REQUIRED AT 4 FEET DUE HARD MATERIAL

N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12" PENETRATION AND THEY WERE OBTAINED USING AN AUTOMATIC HAMMER (UNLESS OTHERWISE NOTED.)

MC = NATURAL MOISTURE CONTENT (%)  
-200 = FINES PASSING #200 SIEVE (%)  
OC = ORGANIC CONTENT (%)

### NOTES

- \* DENOTES DEPTH IN FEET FROM EXISTING GROUND SURFACE
- \*\* SPT N-VALUES SHOWN ABOVE WERE OBTAINED USING AUTOMATIC HAMMERS. GENERALLY DESIGN CORRELATIONS AND PROGRAMS USE SAFETY HAMMER N-VALUES. HENCE, THE ABOVE N-VALUES NEED TO BE MULTIPLIED BY 1.24 TO OBTAIN EQUIVALENT SAFETY HAMMER N-VALUES FOR DESIGN PURPOSE.
- \*\*\* THE LIMESTONE STRATA ENCOUNTERED WITHIN THE PROJECT SITE CONSIST OF A ROCK FORMATION THAT TYPICALLY OFFERS HIGH RESISTANCE TO EXCAVATION AND DRILLING. SPECIAL EQUIPMENT AND BREAKING TOOLS ARE TYPICALLY REQUIRED TO EXCAVATE AND DRILL WITHIN THESE LIMESTONE LAYERS. THESE LIMESTONE LAYERS ARE ALSO DIFFICULT TO DEWATER DUE TO ITS HIGH POROSITY AND PERMEABILITY.

DRAWN BY:  
NG

APPROVED BY:  
RK  
DATE  
06-26-2020

ENGINEER OF RECORD:  
RAJ KRISHNASAMY, P.E.  
FLORIDA LICENSE NO.  
53567

TIERA SOUTH FLORIDA  
2765 VISTA PARKWAY, S-10  
WEST PALM BEACH, FL 33411

SCALE:  
NTS

PROJECT NUMBER:  
7111-20-190

BORING LOCATION PLAN AND SOIL PROFILES  
BELLE GLADE STATE MUNICIPAL  
AIRPORT WATER LIFT STATION  
BELLE GLADE, FLORIDA

Sheet:

1

# APPENDIX B

DEP/HEALTH DEPARTMENT  
STATE OF FLORIDA DOMESTIC WASTEWATER  
COLLECTION/TRANSMISSION INDIVIDUAL  
PERMIT

**Mission:**

To protect, promote & improve the health of all people in Florida through integrated state, county & community efforts.



**Ron DeSantis**  
Governor

**Scott A. Rivkees, MD**  
State Surgeon General

**Vision:** To be the Healthiest State in the Nation

---

**NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT/PERMIT ISSUANCE****PERMITTEE:**

Lomax Harrelle  
City Manager  
City of Belle Glade  
110 Dr. MLK Jr. Blvd W.  
Belle Glade, FL 33430  
[lharrelle@belleglade-fl.com](mailto:lharrelle@belleglade-fl.com)

**PERMIT NUMBER:** 138269-070-DWC  
**ISSUE DATE:** 12/22/2020  
**EXPIRATION DATE:** 12/21/2025  
**COUNTY:** Palm Beach  
**PROJECT NAME:** Belle Glade Airport  
**WASTEWATER TREATMENT:** Western Region WWTF  
**FACILITY ID:** FL0027740

Dear Applicant:

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project and issuance of a permit under the provisions of Palm Beach County Ordinance No. 97-58. Our Office received the Notice on December 17, 2020.

This is to advise you that the Florida Department of Health Palm Beach County (Department), as the delegated agent of the Florida Department of Environmental Protection, does not object to your use of such general permit and that you are hereby authorized to perform the work shown on the approved plan(s) attached hereto and made a part hereof.

Please note the attached requirements apply to your use of this general permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

The owners of the properties shall be responsible for contracting with a licensed and insured environmental services company to provide routine inspection and operation of the grinder systems located within owners' properties. The cost of the environmental services company described in this paragraph shall be an individual owners' expense. The Utility (or City) shall be responsible for ensuring that owners have a valid service contracts prior to allowing connection, and that such contracts are maintained and current

Sincerely,

For the Division Director

Jorge R. Patino, P.E.  
Environmental Administrator  
Division of Environmental Public Health

JH/JP

c: engineer-of-record: Jason Lee, P.E.  
Utility: Jackie Michels, P.E.

---

**Florida Department of Health**

Palm Beach County, Division of Environmental Public Health  
P.O. Box 29, 800 Clematis Street, West Palm Beach, FL 33402  
PHONE: 561-837-5900 • FAX: 561-837-5294

**FloridaHealth.gov, Flhealthpalmbeach.org**



**Accredited Health Department**  
Public Health Accreditation Board

### **FDEP General Permit Requirements**

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the FDEP Internet site at: <http://www.dep.state.fl.us/water/rulesprog.htm#ww> [62-4.540]
2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]
3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]
5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department FDEP Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: <http://www.dep.state.fl.us/water/wastewater/forms.htm> [62-604.700(2)]
6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]
7. Abnormal events shall be reported to the Department's in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

### **Palm Beach County Ordinance No. 97-58 Requirements**

- PBC 1. It shall be the responsibility of the permittee to retain a professional engineer, registered in Florida, to observe that the construction is in accordance with the submitted plans.
- PBC 2. This permit does not include construction of any conflict manholes. The construction shall be strictly in accordance with the "Standard Water and Sewer Separation Statement" and other design specifications noted on the engineering plans. If field conditions require deviations from the proposed design, the project engineer shall consult with the Department prior to construction.
- PBC 3. Prior to construction, all required permits or approvals must be obtained for all aspects of the project from the appropriate agencies.
- PBC 4. Applications for abandonment of all septic systems serving this property must be submitted prior to final approval for use.
- PBC 5. An inspection by the Health Department is required prior to release. The fee for this inspection is \$100.00 payable to Florida Department of Health - Palm Beach County.
- PBC 6. The lift station and control panel shall be secured to prevent vandalism or unauthorized access.
- PBC 7. Provide a notice on the lift station panel indicating the following:
- a. Name and phone number of person to contact in case of emergency.
  - b. Name and phone number of the septic tank company to call for pump-out in case of overflow.



## Florida Department of Environmental Protection

### NOTIFICATION/APPLICATION FOR CONSTRUCTING A DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEM

#### PART I - GENERAL

##### Subpart A: Permit Application Type

Permit Application Type (mark one only)	EDUs Served	Application Fee*	"X"
Are you applying for an individual permit for a domestic wastewater collection/transmission system? Note: an EDU is equal to 3.5 persons. Criteria for an individual permit are contained in Rule 62-604.600(7), F.A.C.	≥ 10	\$500	
	< 10	\$300	
Is this a Notice of Intent to use the general permit for wastewater collection/transmission systems? Criteria for qualifying for a general permit are contained in Rule 62-604.600(6), F.A.C. Projects not meeting the criteria in Rule 62-604.600(6), F.A.C., must apply for an individual permit.	N/A	\$250	X

\*Note: Each non-contiguous project (i.e., projects that are not interconnected or are not located on adjacent streets or in the same neighborhood) requires a separate application and fee.

##### Subpart B: Instructions

- (1) This form shall be completed for all domestic wastewater collection/transmission system construction projects as follows:
  - If this is a Notice of Intent to use the general permit, this notification shall be submitted to the Department at least 30 days prior to initiating construction.
  - If this is an application for an individual permit, the permit must be obtained prior to initiating construction.
- (2) One copy of the completed form shall be submitted to the appropriate DEP district office or delegated local program along with the appropriate fee, and one copy of the following supporting documents. Checks should be made payable to the Florida Department of Environmental Protection, or the name of the appropriate delegated local program.
  - If this is a Notice of Intent to use the general permit, attach a site plan or sketch showing the size and approximate location of new or altered gravity sewers, pump stations and force mains; showing the approximate location of manholes and isolation valves; and showing how the proposed project ties into the existing or proposed wastewater facilities. The site plan or sketch shall be signed and sealed by a professional engineer registered in Florida.
  - If this is an application for an individual permit, one set of plans and specifications shall be submitted with this application, or alternatively, an engineering report shall be submitted. Plans and specifications and engineering reports shall be prepared in accordance with the applicable provisions of Chapters 10 and 20 of *Recommended Standards for Wastewater Facilities*. The plans and specifications or engineering report shall be signed and sealed by a Professional Engineer registered in Florida.
- (3) All information shall be typed or printed in ink. Where attached sheets (or other technical documentation) are utilized in lieu of the blank spaces provided, indicate appropriate cross-references on the form. For Items (1) through (4) of Part II of this application form, if an item is not applicable to your project, indicate "NA" in the appropriate space provided.

RECEIVED

DEC 17 2020

Florida Department of Health - PBC  
Plan Review

## PART II – PROJECT DOCUMENTATION

### (1) Collection/Transmission System Permittee

Name Lomax Harrelle Title City Manager  
 Company Name City of Belle Glade  
 Address 110 Dr. M.L.K. Jr. Blvd W.  
 City Belle Glade State FL Zip 33430  
 Telephone 561-996-0100 Fax 561-692-9730 Email lharrelle@belleglade-fl.com

### (2) General Project Information

Project Name Belle Glade Airport Liftstation  
 Location: County Palm Beach City Belle Glade Section 29 Township 43 Range 37  
 Project Description and Purpose (including pipe length, range of pipe diameter, total number of manholes, and total number of pump stations):  
 Please see attached Exhibit A for a project description and purpose.

Estimated date for: Start of construction January 2021 Completion of construction August 2021  
 Connections to existing system or treatment plant One connection

### (3) Project Capacity

A = Type of Unit	B = Number of Units	C = Population Per Unit	D = Total Population (Columns B x C)	E = Per Capita Flow	F = Total Average Daily Flow (Columns D x E)	G = Peak hour flow
Single-Family Home						
Mobile Home						
Apartment						
Commercial, Institutional, or Industrial Facility *	4	8	32	15gpd	480gpd	1.4gpm
Total						

\* Description of commercial, institutional, and industrial facilities and explanation of method used to estimate per capita flow for these facilities:

Please see attached Exhibit A for information about the project capacity.

### (4) Pump Station Data (attached additional sheets as necessary)

Location	Type	Estimated Flow to the Station (GPD)			Operating Conditions (GPM @ FT (TDH))
		Maximum	Average	Minimum	
<u>Airport</u>	<u>Submersible</u>		480gpd		23gpm at 82ft

### (5) Collection/Transmission System Design Information

- A. This information must be completed for all projects by the applicant's professional engineer, and if applicable, those professional engineers in other disciplines who assisted with the design of the project.

If this project has been designed to comply with the standards and criteria listed below, the engineer shall initial in ink before the standards or criteria. If any of the standards or criteria do not apply to this project or if this project has not been designed to comply with the standards or criteria, mark "X" before the appropriate standard or criteria and provide an explanation, including any applicable rule references, in (5)B. below.

Note, if the project has not been designed in accordance with the standards and criteria set forth in Rules 62-604.400(1) and (2), F.A.C., an application for an individual permit shall be submitted. However, if Rules 62-604.400(1) and (2), F.A.C., specifically allow for another alternative that will result in an equivalent level of reliability and public health protection, the project can be constructed using the general permit.

#### General Requirements

1. The project is designed based on an average daily flow of 100 gallons per capita plus wastewater flow from industrial plants and major institutional and commercial facilities unless water use data or other justification is used to better estimate the flow. The design includes an appropriate peaking factor, which covers I/I contributions and non-wastewater connections to those service lines. [RSWF 11.243]
2. Procedures are specified for operation of the collection/transmission system during construction. [RSWF 20.15]
3. The project is designed to be located on public right-of-ways, land owned by the permittee, or easements and to be located no closer than 100 feet from a public drinking water supply well and no closer than 75 feet from a private drinking water supply well; or documentation is provided in Part II.(5)B., showing that another alternative will result in an equivalent level of reliability and public health protection. [62-604.400(1)(b) and (c), F.A.C.]
4. The project is designed with no physical connections between a public or private potable water supply system and a sewer or force main and with no water pipes passing through or coming into contact with any part of a sewer manhole. [RSFW 38.1 and 48.5]
5. The project is designed to preclude the deliberate introduction of storm water, surface water, groundwater, roof runoff, subsurface drainage, swimming pool drainage, air conditioning system condensate water, non-contact cooling water except as provided by Rule 62-610.668(1), F.A.C., and sources of uncontaminated wastewater, except to augment the supply of reclaimed water in accordance with Rule 62-610.472(3)(c), F.A.C. [62-604.400(1)(d), F.A.C.]
6. The project is designed so that all new or relocated, buried sewers and force mains, are located in accordance with the separation requirements from water mains and reclaimed water lines of Rules 62-604.400(2)(g)(h) and (i) and (3), F.A.C. Note, if the criteria of Rules 62-604.400(2)(g) 4. or (2)(i) 3., F.A.C., are used, describe in Part II.(5)Bc. alternative construction features that will be provided to afford a similar level of reliability and public health protection. [62-604.400(2)(g), (h), and (i) and (3), F.A.C.]

#### Gravity Sewers

7. The project is designed with no public gravity sewer conveying raw wastewater less than 8 inches in diameter. [RSWF 33.1]
8. The design considers buoyancy of sewers, and appropriate construction techniques are specified to prevent flotation of the pipe where high groundwater conditions are anticipated. [RSWF 33.3]
9. All sewers are designed with slopes to give mean velocities, when flowing full, of not less than 2.0 feet per second, based on Manning's formula using an "n" value of 0.013; or if it is not practicable to maintain these minimum slopes and the depth of flow will be 0.3 of the diameter or greater for design average flow, the owner of the system has been notified that additional sewer maintenance will be required. The pipe diameter and slope are selected to obtain the greatest practical velocities to minimize solids deposition problems. Oversized sewers are not specified to justify flatter slopes. [RSWF 33.41, 33.42, and 33.43]
10. Sewers are designed with uniform slope between manholes. [RWSF 33.44]
11. Where velocities greater than 15 fps are designed, provisions to protect against displacement by erosion and impact are specified. [RSWF 33.45]
12. Sewers on 20% slopes or greater are designed to be anchored securely with concrete, or equal, anchors spaced as follows: not over 36 feet center to center on grades 20% and up to 35%; not over 24 feet center to center on grades 35% and up to 50%; and not over 16 feet center to center on grades 50% and over. [RSWF 33.46]

13. Sewers 24 inches or less are designed with straight alignment between manholes. Where curvilinear sewers are proposed for sewers greater than 24 inches, the design specifies compression joints; ASTM or specific pipe manufacturer's maximum allowable pipe joint deflection limits are not exceeded; and curvilinear sewers are limited to simple curves which start and end at manholes. [RSWF 33.5]
14. Suitable couplings complying with ASTM specifications are required for joining dissimilar materials. [RSWF 33.7]
15. Sewers are designed to prevent damage from superimposed loads. [RSWF 33.7]
16. Appropriate specifications for the pipe and methods of bedding and backfilling are provided so as not to damage the pipe or its joints, impede cleaning operations and future tapping, nor create excessive side fill pressures and ovalation of the pipe, nor seriously impair flow capacity. [RSWF 33.81]
17. Appropriate deflection tests are specified for all flexible pipe. Testing is required after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system. Testing requirements specify: 1) no pipe shall exceed a deflection of 5%; 2) using a rigid ball or mandrel for the deflection test with a diameter not less than 95% of the base inside diameter or average inside diameter of the pipe, depending on which is specified in the ASTM specification, including the appendix, to which the pipe is manufactured; and 3) performing the test without mechanical pulling devices. [RSWF 33.85]
18. Leakage tests are specified requiring that: 1) the leakage exfiltration or infiltration does not exceed 200 gallons per inch of pipe diameter per mile per day for any section of the system; 2) exfiltration or infiltration tests be performed with a minimum positive head of 2 feet; and 3) air tests, as a minimum, conform to the test procedure described in ASTM C-828 for clay pipe, ASTM C 924 for concrete pipe, ASTM F-1417 for plastic pipe, and for other materials appropriate test procedures. [RSWF 33.93, 33.94, and 33.95]
- X 19. If an inverted siphon is proposed, documentation of its need is provided in Part II.(5)BC. Inverted siphons are designed with: 1) at least two barrels; 2) a minimum pipe size of 6 inches; 3) necessary appurtenances for maintenance, convenient flushing, and cleaning equipment; and 4) inlet and discharge structures having adequate clearances for cleaning equipment, inspection, and flushing. Design provides sufficient head and appropriate pipe sizes to secure velocities of at least 3.0 fps for design average flows. The inlet and outlet are designed so that the design average flow may be diverted to one barrel, and that either barrel may be cut out of service for cleaning. [RSWF 35]

#### Manholes

20. The project is designed with manholes at the end of each line; at all changes in grade, size, or alignment; at all intersections; and at distances not greater than 400 feet for sewers 15 inches or less and 500 feet for sewers 18 inches to 30 inches, except in the case where adequate modern cleaning equipment is available at distances not greater than 600 feet. [RSWF 34.1]
21. Design requires drop pipes to be provided for sewers entering manholes at elevations of 24 inches or more above the manhole invert. Where the difference in elevation between the incoming sewer and the manhole invert is less than 24 inches, the invert is designed with a fillet to prevent solids deposition. Inside drop connections (when necessary) are designed to be secured to the interior wall of the manhole and provide access for cleaning. Design requires the entire outside drop connection be encased in concrete. [RSWF 34.2]
22. Manholes are designed with a minimum diameter of 48 inches and a minimum access diameter of 22 inches. [RSWF 34.3]
23. Design requires that a bench be provided on each side of any manhole channel when the pipe diameter(s) are less than the manhole diameter and that no lateral sewer, service connection, or drop manhole pipe discharges onto the surface of the bench. [RSWF 34.5]
24. Design requires: 1) manhole lift holes and grade adjustment rings be sealed with non-shrinking mortar or other appropriate material; 2) inlet and outlet pipes be joined to the manhole with a gasketed flexible watertight connection or another watertight connection arrangement that allows differential settlement of the pipe and manhole wall; and 3) watertight manhole covers be used wherever the manhole tops may be flooded by street runoff or high water. [RSWF 34.6]
25. Manhole inspection and testing for watertightness or damage prior to placing into service are specified. Air testing, if specified for concrete sewer manholes, conforms to the test procedures described in ASTM C-1244. [RSWF 34.7]
- X 26. Electrical equipment specified for use in manholes is consistent with Item 46 of this checklist. [RSWF 34.9]

### Stream Crossings

- X 27. Sewers and force mains entering or crossing streams are designed to be constructed of ductile iron pipe with mechanical joints or so they will remain watertight and free from changes in alignment or grade. Appropriate materials which will not readily erode, cause siltation, damage pipe during placement, or corrode the pipe are specified to backfill the trench. [RSWF 36.21 and 48.5]
- X 28. Stream crossings are designed to incorporate valves or other flow regulating devices (which may include pump stations) on the shoreline or at such distances from ~~from~~ the shoreline to prevent discharge in the event the line is damaged. [62-604.400(2)(k)5., F.A.C.]
- X 29. Sewers and force mains entering or crossing streams are designed at a sufficient depth below the natural bottom of the stream bed to protect the line. At a minimum, the project is designed with subaqueous lines to be buried at least three feet below the design or actual bottom, whichever is deeper, of a canal and other dredged waterway or the natural bottom of streams, rivers, estuaries, bays, and other natural water bodies; or if it is not practicable to design the project with less than three-foot minimum cover, alternative construction features (e.g. a concrete cap, sleeve, or some other properly engineered device to insure adequate protection of the line) are described in Part II.C. [62-604.400(2)(k)1., F.A.C., and RSWF 36.11]
- X 30. Specifications require permanent warning signs be placed on the banks of canals, streams, and rivers clearly identifying the nature and location (including depths below design or natural bottom) of subaqueous crossings and suitably fixed signs be placed at the shore, for subaqueous crossings of lakes, bays, and other large bodies of water, and in any area where anchoring is normally expected. [62-604.400(2)(k)2., F.A.C.]
- X 31. Provisions for testing the integrity of subaqueous lines are specified. [62-604.400(2)(k)4., F.A.C.]
- X 32. Supports are designed for all joints in pipes utilized for aerial crossings and to prevent overturning and settlement. Expansion jointing is specified between above ground and below ground sewers and force mains. The design considers the impact of floodwaters and debris. [RSWF 37 and 48.5]
- X 33. Aerial crossings are designed to maintain existing or required navigational capabilities within the waterway and to reserve riparian rights of adjacent property owners. [62-604.400(2)(k)3., F.A.C.]

### Pump Stations

- 41 34. In areas with high water tables, pump stations are designed to withstand flotation forces when empty. When siting the pump station, the design considers the potential for damage or interruption of operation because of flooding. Pump station structures and electrical and mechanical equipment are designed to be protected from physical damage by the 100-year flood. Pump stations are designed to remain fully operational and accessible during the 25-year flood unless lesser flood levels are appropriate based on local considerations, but not less than the 10-year flood. [62-604.400(2)(e), F.A.C.]
- 41 35. Pump stations are designed to be readily accessible by maintenance vehicles during all weather conditions. [RSWF 41.2]
- 41 36. Wet well and pump station piping is designed to avoid operational problems from the accumulation of grit. [RSWF 41.3]
- X 37. Dry wells, including their superstructure, are designed to be completely separated from the wet well. Common walls are designed to be gas tight. [RSWF 42.21]
- 42 38. The design includes provisions to facilitate removing pumps, motors, and other mechanical and electrical equipment. [RSWF 42.22]

X

39. The design includes provisions for: 1) suitable and safe means of access for persons wearing self-contained breathing apparatus are provided to dry wells, and to wet wells; 2) stairway access to wet wells more than 4 feet deep containing either bar screens or mechanical equipment requiring inspection or maintenance; 3) for built-in-place pump stations, a stairway to the dry well with rest landings at vertical intervals not to exceed 12 feet; 4) for factory-built pump stations over 15 feet deep, a rigidly fixed landing at vertical intervals not to exceed 10 feet unless a manlift or elevator is provided; and 5) where a landing is used, a suitable and rigidly fixed barrier to prevent an individual from falling past the intermediate landing to a lower level. If a manlift or elevator is provided, emergency access is included in the design. [RSWF 42.23]

42

40. Specified construction materials are appropriate under conditions of exposure to hydrogen sulfide and other corrosive gases, greases, oils, and other constituents frequently present in wastewater. [RSWF 42.25]

42

41. Except for low-pressure grinder or STEP systems, multiple pumps are specified, and each pump has an individual intake. Where only two units are specified, they are of the same size. Specified units have capacity such that, with any unit out of service, the remaining units will have capacity to handle the design peak hourly flow. [RSWF 42.31 and 42.36]

X

42. Bar racks are specified for pumps handling wastewater from 30 inch or larger diameter sewers. Where a bar rack is specified, a mechanical hoist is also provided. The design includes provisions for appropriate protection from clogging for small pump stations. [RSWF 42.322]

42

43. Pumps handling raw wastewater are designed to pass spheres of at least 3 inches in diameter. Pump suction and discharge openings are designed to be at least 4 inches in diameter. [RSWF 42.33] (Note, this provision is not applicable to grinder pumps.)

42

44. The design requires pumps be placed such that under normal operating conditions they will operate under a positive suction head, unless pumps are suction-lift pumps. [RSWF 42.34]

42

45. The design requires: 1) pump stations be protected from lightning and transient voltage surges; and 2) pump stations be equipped with lightning arrestors, surge capacitors, or other similar protection devices and phase protection. Note, pump stations serving a single building are not required to provide surge protection devices if not necessary to protect the pump station. [62-604.400(2)(b), F.A.C.]

42

46. The design requires 1) electrical systems and components (e.g., motors, lights, cables, conduits, switch boxes, control circuits, etc.) in raw wastewater wet wells, or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors may be present, comply with the National Electrical Code requirements for Class I Group D, Division 1 locations; 2) electrical equipment located in wet wells be suitable for use under corrosive conditions; 3) each flexible cable be provided with a watertight seal and separate strain relief; 4) a fused disconnect switch located above ground be provided for the main power feed for all pump stations; 5) electrical equipment exposed to weather to meet the requirements of weatherproof equipment NEMA 3R or 4; 6) a 110 volt power receptacle to facilitate maintenance be provided inside the control panel for pump stations that have control panels outdoors; and 7) ground fault interruption protection be provided for all outdoor outlets. [RSWF 42.35]

X

47. The design requires a sump pump equipped with dual check valves be provided in dry wells to remove leakage or drainage with discharge above the maximum high water level of the wet well. [RSWF 42.37]

X

48. Pump station design capacities are based on the peak hourly flow and are adequate to maintain a minimum velocity of 2 feet per second in the force main. [RSWF 42.38]

49. The design includes provisions to automatically alternate the pumps in use. [RSWF 42.4]

42

50. The design requires: 1) suitable shutoff valves be placed on the suction line of dry pit pumps; 2) suitable shutoff and check valves be placed on the discharge line of each pump (except on screw pumps); 3) a check valve be located between the shutoff valve and the pump; 4) check valves be suitable for the material being handled; 5) check valves be placed on the horizontal portion of discharge piping (except for ball checks, which may be placed in the vertical run); 6) all valves be capable of withstanding normal pressure and water hammer; and 7) all shutoff and check valves be operable from the floor level and accessible for maintenance. [RSWF 42.5]

X

51. The effective volume of wet wells is based on design average flows and a filling time not to exceed 30 minutes unless the facility is designed to provide flow equalization. The pump manufacturer's duty cycle recommendations were utilized in selecting the minimum cycle time. [RSWF 42.62]

42

52. The design requires wet well floors have a minimum slope of 1 to 1 to the hopper bottom and the horizontal area of hopper bottoms be no greater than necessary for proper installation and function of the inlet. [RSWF 42.63]

53. For covered wet wells, the design provides for air displacement to the atmosphere, such as an inverted "j" tube or other means. [RSWF 42.64]
- X 54. The design provides for adequate ventilation all pump stations; mechanical ventilation where the dry well is below the ground surface; permanently installed ventilation if screens or mechanical equipment requiring maintenance or inspection are located in the wet well. Pump stations are designed with no interconnection between the wet well and dry well ventilation systems. [RSWF 42.71]
- X 55. The design requires all intermittently operated ventilation equipment to be interconnected with the respective pit lighting system and the manual lighting/ventilation switch to override the automatic controls. [RSWF 42.73]
- X 56. The design requires the fan wheels of ventilation systems be fabricated from non-sparking material and automatic heating and dehumidification equipment be provided in all dry wells. [RSWF 42.74]
- X 57. If wet well ventilation is continuous, design provides for at least 12 complete 100% fresh air changes per hour; if wet well ventilation is intermittent, design provides for at least 30 complete 100% fresh air changes per hour; and design requires air to be forced into wet wells by mechanical means rather than solely exhausted from the wet well. [RSWF 42.75]
- X 58. If dry well ventilation is continuous, design provides at least 6 complete 100% fresh air changes per hour; and dry well ventilation is intermittent, design provides for at least 30 complete 100% fresh air changes per hour, unless a system of two speed ventilation with an initial ventilation rate of 30 changes per hour for 10 minutes and automatic switch over to 6 changes per hour is used to conserve heat. [RSWF 42.76]
59. Pump stations are designed and located on the site to minimize adverse effects from odors, noise, and lighting. [62-604.400(2)(c), F.A.C.]
60. The design requires pump stations be enclosed with a fence or otherwise designed with appropriate features to discourage the entry of animals and unauthorized persons. Posting of an unobstructed sign made of durable weather resistant material at a location visible to the public with a telephone number for a point of contact in case of emergency is specified. [62-604.400(2)(d), F.A.C.]
- X 61. The design requires suitable devices for measuring wastewater flow at all pump stations. Indicating, totalizing, and recording flow measurement are specified for pump stations with a 1200 gpm or greater design peak flow. [RSWF 42.8]
62. The project is designed with no physical connections between any potable water supplies and pump stations. If a potable water supply is brought to a station, reduced-pressure principle backflow-prevention assemblies are specified. [RSWF 42.9 and 62-555.30(4), F.A.C.]

Additional Items to be Completed for Suction-Lift Pump Stations

- X 63. The design requires all suction-lift pumps to be either self-priming or vacuum-priming and the combined total of dynamic suction-lift at the "pump off" elevation and required net positive suction head at design operating conditions not to exceed 22 feet. For self-priming pumps, the design requires: 1) pumps be capable of rapid priming and repriming at the "lead pump on" elevation with self-priming and repriming accomplished automatically under design operating conditions; 2) suction piping not to exceed the size of the pump suction or 25 feet in total length; and 3) priming lift at the "lead pump on" elevation to include a safety factor of at least 4 feet from the maximum allowable priming lift for the specific equipment at design operating conditions. For vacuum-priming pump stations, the design requires dual vacuum pumps capable of automatically and completely removing air from the suction-lift pumps and the vacuum pumps be adequately protected from damage due to wastewater. [RSWF 43.1]
- X 64. The design requires: 1) suction-lift pump equipment compartments to be above grade or offset and to be effectively isolated from the wet well to prevent a hazardous and corrosive sewer atmosphere from entering the equipment compartment; 2) wet well access not to be through the equipment compartment and to be at least 24 inches in diameter; 3) gasketed replacement plates be provided to cover the opening to the wet well for pump units to be remove for service; and 4) no valving be located in the wet well. [RSWF 43.2]

#### Additional Items to be Completed for Submersible Pump Stations

65. Submersible pumps and motors are designed specifically for raw wastewater use, including totally submerged operation during a portion of each pump cycle and to meet the requirements of the National Electrical Code for such units. Provisions for detecting shaft seal failure or potential seal failure are included in the design. [RSWF 44.1]
66. The design requires submersible pumps be readily removable and replaceable without dewatering the wet well or disconnecting any piping in the wet well. [RSWF 44.2]
67. In submersible pump stations, electrical supply, control, and alarm circuits are designed to provide strain relief; to allow disconnection from outside the wet well; and to protect terminals and connectors from corrosion by location outside the wet well or through use of watertight seals. [RSWF 44.31]
68. In submersible pump stations, the design requires the motor control center to be located outside the wet well, readily accessible, and protected by a conduit seal or other appropriate measures meeting the requirements of the National Electrical Code, to prevent the atmosphere of the wet well from gaining access to the control center. If a seal is specified, the motor can be removed and electrically disconnected without disturbing the seal. The design requires control equipment exposed to weather to meet the requirements of weatherproof equipment NEMA 3R or 4. [RSWF 44.32]
69. In submersible pump stations, the design requires: 1) pump motor power cords be flexible and serviceable under conditions of extra hard usage and to meet the requirements of the National Electrical Code standards for flexible cords in wastewater pump stations; 2) ground fault interruption protection be used to de-energize the circuit in the event of any failure in the electrical integrity of the cable; and 3) power cord terminal fittings be corrosion-resistant and constructed in a manner to prevent the entry of moisture into the cable, provided with strain relief appurtenances, and designed to facilitate field connecting. [RSWF 44.33]
70. In submersible pump stations, the design requires all shut-off and check valves be located in a separate valve pit. Provisions to remove or drain accumulated water from the valve pit are included in the design. [RSWF 44.4]

#### Emergency Operations for Pump Stations

71. Pump stations are designed with an alarm system which activates in cases of power failure, sump pump failure, pump failure, unauthorized entry, or any cause of pump station malfunction. Pump station alarms are designed to be telemetered to a facility that is manned 24 hours a day. If such a facility is not available and a 24-hour holding capacity is not provided, the alarm is designed to be telemetered to utility offices during normal working hours and to the home of the responsible person(s) in charge of the lift station during off-duty hours. Note, if an audio-visual alarm system with a self-contained power supply is provided in lieu of a telemetered system, documentation is provided in Part II.(5)B.C. showing an equivalent level of reliability and public health protection. [RSWF 45]
- X 72. The design requires emergency pumping capability be provided for all pump stations. For pump stations that receive flow from one or more pump stations through a force main or pump stations discharging through pipes 12 inches or larger, the design requires uninterrupted pumping capability be provided, including an in-place emergency generator. Where portable pumping and/or generating equipment or manual transfer is used, the design includes sufficient storage capacity with an alarm system to allow time for detection of pump station failure and transportation and connection of emergency equipment. [62-604.400(2)(a)1. and 2., F.A.C., and RSWF 46.423 and 46.433]
- X 73. The design requires: 1) emergency standby systems to have sufficient capacity to start up and maintain the total rated running capacity of the station, including lighting, ventilation, and other auxiliary equipment necessary for safety and proper operation; 2) special sequencing controls be provided to start pump motors unless the generating equipment has capacity to start all pumps simultaneously with auxiliary equipment operating; 3) a riser from the force main with rapid connection capabilities and appropriate valving be provided for all pump stations to hook up portable pumps; and 4) all pump station reliability design features be compatible with the available temporary service power generating and pumping equipment of the authority responsible for operation and maintenance of the collection/transmission system. [62-604.400(2)(a)3., F.A.C., and RSWF 46.431]
- X 74. The design provides for emergency equipment to be protected from operation conditions that would result in damage to the equipment and from damage at the restoration of regular electrical power. [RSWF 46.411, 46.417, and 46.432]

- X 75. For permanently-installed internal combustion engines, underground fuel storage and piping facilities are designed in accordance with applicable state and federal regulations; and the design requires engines to be located above grade with adequate ventilation of fuel vapors and exhaust gases. [RSWF 46.414 and 46.415]
- X 76. For permanently-installed or portable engine-driven pumps are used, the design includes provisions for manual start-up. [RSWF 46.422]
- X 77. Where independent substations are used for emergency power, each separate substation and its associated transmission lines is designed to be capable of starting and operating the pump station at its rated capacity. [RSWF 46.44]

#### Force Mains

- X 78. Force mains are designed to maintain, at design pumping rates, a cleansing velocity of at least 2 feet per second. The minimum force main diameter specified for raw wastewater is not less than 4 inches. [RSWF 48.1]
79. The design requires: 1) branches of intersecting force mains be provided with appropriate valves such that one branch may be shut down for maintenance and repair without interrupting the flow of other branches; and 2) stubouts on force mains, placed in anticipation of future connections, be equipped with a valve to allow such connection without interruption of service. [62-604.400(2)(f), F.A.C.]
80. The design requires air relief valves be placed at high points in the force main to prevent air locking. [RSWF 48.2]
81. Specified force main pipe and joints are equal to water main strength materials suitable for design conditions. The force main, reaction blocking, and station piping are designed to withstand water hammer pressures and stresses associated with the cycling of wastewater pump stations. [RSWF 48.4]
82. When the Hazen and Williams formula is used to calculate friction losses through force mains, the value for "C" is 100 for unlined iron or steel pipe for design. For other smooth pipe materials, such as PVC, polyethylene, lined ductile iron, the value for C does not exceed 120 for design. [RSWF 48.61]
83. Where force mains are constructed of material, which might cause the force main to be confused with potable water mains, specifications require the force main to be clearly identified. [RSWF 48.7]
84. Leakage tests for force mains are specified including testing methods and leakage limits. [RSWF 48.8]

\*RSWF = *Recommended Standards for Wastewater Facilities* (1997) as adopted by rule 62-604.300(5)(g), F.A.C.

B. Explanation for Requirements or Standards Marked "X" in II(5)A. Above (Attach additional sheets if necessary):

Please see attached Exhibit A for information about the explanations for requirements or standards marked "X".

### PART III - CERTIFICATIONS

#### (1) Collection/Transmission System Permittee

I, the undersigned owner or authorized representative\* of City of Belle Glade am fully aware that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. I agree to retain the design engineer or another professional engineer registered in Florida, to conduct on-site observation of construction, to prepare a certification of completion of construction, and to review record drawings for adequacy. Further, I agree to provide an appropriate operation and maintenance manual for the facilities pursuant to Rule 62-604.500(4), F.A.C., and to retain a professional engineer registered in Florida to examine (or to prepare if desired) the manual. I am fully aware that Department approval must be obtained before this project is placed into service for any purpose other than testing for leaks and testing equipment operation.

Signed Lomax Harrelle  
Name Lomax Harrelle

Date 9-17-2020  
Title City Manager

\*Attach a letter of authorization.

(2) Owner of Collection/Transmission System

I, the undersigned owner or authorized representative\* of City of Belle Glade certify that we will be the Owner of this project after it is placed into service. I agree that we will operate and maintain this project in a manner that will comply with applicable Department rules. Also I agree that we will promptly notify the Department if we sell or legally transfer ownership of this project.

Signed [Signature] Date 9-17-2020  
Name Lomax Harrelle Title City Manager  
Company Name City of Belle Glade  
Address 110 Dr. M.L.K. Jr. Blvd W.  
City Belle Glade State FL Zip 33430  
Telephone 561-996-0100 Fax 561-692-9730 Email lharrelle@belleglade-fl.com

\* Attach a letter of authorization.

(3) Wastewater Facility Serving Collection/Transmission System\*\*

If this is a Notice of Intent to use a general permit, check here:

☐ The undersigned owner or authorized representative\* of the \_\_\_\_\_ wastewater facility hereby certifies that the above referenced facility has the capacity to receive the wastewater generated by the proposed collection system; is in compliance with the capacity analysis report requirements of Rule 62-600.405, F.A.C.; is not under a Department order associated with effluent violations or the ability to treat wastewater adequately; and will provide the necessary treatment and disposal as required by Chapter 403, F.S., and applicable Department rules.

If this is an application for an individual permit, check one:

☒ The undersigned owner or authorized representative\* of the Palm Beach County Water Utilities wastewater facility hereby certifies that the above referenced facility has and will have adequate reserve capacity to accept the flow from this project and will provide the necessary treatment and disposal as required by Chapter 403, F.S., and applicable Department rules.

☐ The undersigned owner or authorized representative\* of the \_\_\_\_\_ wastewater facility hereby certifies that the above referenced facility currently does not have, but will have prior to placing the proposed project into operation, adequate reserve capacity to accept the flow from this project and will provide the necessary treatment and disposal as required by Chapter 403, F.S., and applicable Department rules.

Name of Treatment Plant Serving Project Western Region WWTP  
County Palm Beach City City of Belle Glade  
DEP permit number FL A027740 Expiration Date 5/22/2021  
Maximum monthly average daily flow over the last 12 month period 4.51 MGD Month(s) used 7/19 - 6/20  
Maximum three-month average daily flow over the last 12 month period 3.98 MGD Month(s) used 6/19 - 8/19  
Current permitted capacity 6.5 MGD ☐ AADF ☐ MADF ☒ TMADF  
Current outstanding flow commitments (including this project) against treatment plant capacity:

Signed \_\_\_\_\_ Date \_\_\_\_\_  
Name Jackie Michels, P.E. Title Public Utilities Engineer  
Address 8100 Forest Hill Boulevard  
City West Palm Beach State FL Zip 33413  
Telephone 561-493-6116 Fax 561-493-6113 Email jmichels@pbcwater.com

\* Attach a letter of authorization.

\*\* If there is an intermediate collection system, a letter shall be attached certifying that the intermediate downstream collection system has adequate reserve capacity to accept the flow from this project.

(2) Owner of Collection/Transmission System

I, the undersigned owner or authorized representative\* of Palm Beach County Water Utilities Department certify that we will be the Owner of this project after it is placed into service. I agree that we will operate and maintain this project in a manner that will comply with applicable Department rules. Also I agree that we will promptly notify the Department if we sell or legally transfer ownership of this project.

Signed [Signature] Date DEC 16 2020  
Name Jackie Michels, P.E. Title Plan Review Manager  
Company Name Palm Beach County Water Utilities Department  
Address 8100 Forest Hill Boulevard  
City West Palm Beach State FL Zip 33413  
Telephone 561-493-6116 Fax 561-493-6113 Email jnichels@pbcwater.com

\* Attach a letter of authorization.

(3) Wastewater Facility Serving Collection/Transmission System\*\*

If this is a Notice of Intent to use a general permit, check here:

- ☒ The undersigned owner or authorized representative\* of the WESTERN REGION WWTF wastewater facility hereby certifies that the above referenced facility has the capacity to receive the wastewater generated by the proposed collection system; is in compliance with the capacity analysis report requirements of Rule 62-600.405, F.A.C.; is not under a Department order associated with effluent violations or the ability to treat wastewater adequately; and will provide the necessary treatment and disposal as required by Chapter 403, F.S., and applicable Department rules.

If this is an application for an individual permit, check one:

- ☐ The undersigned owner or authorized representative\* of the \_\_\_\_\_ wastewater facility hereby certifies that the above referenced facility has and will have adequate reserve capacity to accept the flow from this project and will provide the necessary treatment and disposal as required by Chapter 403, F.S., and applicable Department rules.
- ☐ The undersigned owner or authorized representative\* of the \_\_\_\_\_ wastewater facility hereby certifies that the above referenced facility currently does not have, but will have prior to placing the proposed project into operation, adequate reserve capacity to accept the flow from this project and will provide the necessary treatment and disposal as required by Chapter 403, F.S., and applicable Department rules.

Name of Treatment Plant Serving Project WESTERN REGION WWTF  
County PALM BEACH City BELLE GLADE  
DEP permit number FL A027740 Expiration Date 05/22/2021  
Maximum monthly average daily flow over the last 12 month period 4.30 MGD Month(s) used 5/18-4/19  
Maximum three-month average daily flow over the last 12 month period 3.65 MGD Month(s) used 5/18-7/18  
Current permitted capacity 6.50 MGD ☐ AADF ☐ MADF ☒ TMADF  
Current outstanding flow commitments (including this project) against treatment plant capacity: MGD

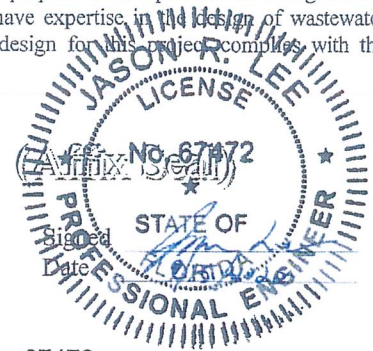
Signed [Signature] Date DEC 16 2020  
Name Jackie Michels, P.E. Title Plan Review Manager  
Address 8100 Forest Hill Boulevard  
City West Palm Beach State FL Zip 33413  
Telephone 561-493-6116 Fax 561-493-6113 Email jnichels@pbcwater.com

\* Attach a letter of authorization.

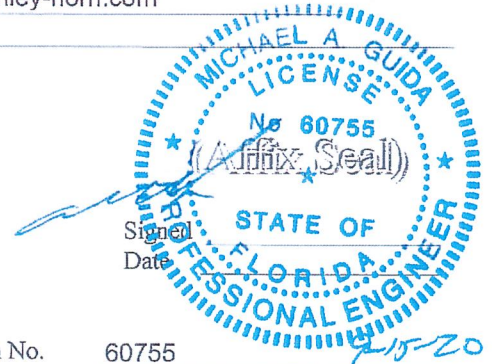
\*\* If there is an intermediate collection system, a letter shall be attached certifying that the intermediate downstream collection system has adequate reserve capacity to accept the flow from this project.

(4) Professional Engineer Registered in Florida

I, the undersigned professional engineer registered in Florida, certify that I am in responsible charge of the preparation and production of engineering documents for this project; that plans and specifications for this project have been completed; that I have expertise in the design of wastewater collection/transmission systems; and that, to the best of my knowledge and belief, the engineering design for this project complies with the requirements of Chapter 62-604, F.A.C.



Name Jason R. Lee Florida Registration No. 67472  
Company Name Kimley-Horn and Associates, Inc.  
Address 1920 Wekiva Way, Suite 200  
City West Palm Beach State FL Zip 33411  
Telephone 845-0665 Fax 561-863-8175 Email jason.lee@kimley-horn.com  
Portion of Project for Which Responsible Civil and Mechanical



Name Michael A. Guida Florida Registration No. 60755  
Company Name C&W Engineering  
Address 2775 Vista Parkway, Suite G-6  
City West Palm Beach State FL Zip 33411  
Telephone 642-5333 Fax 561-966-2293 Email mguida@cweng.us  
Portion of Project for Which Responsible Electrical

((Affix Seal))

Signed \_\_\_\_\_  
Date \_\_\_\_\_

Name \_\_\_\_\_ Florida Registration No. \_\_\_\_\_  
Company Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_  
Portion of Project for Which Responsible \_\_\_\_\_

# APPENDIX C

PALM BEACH COUNTY  
LAND DEVELOPMENT DIVISION  
RIGHT-OF-WAY CONSTRUCTION  
UTILITY PERMIT

**PALM BEACH COUNTY LAND DEVELOPMENT DIVISION**  
**RIGHT-OF-WAY CONSTRUCTION - UTILITY PERMIT**

**PROJECT NAME:** BELLE GLADE AIRPORT LIFT STATION  
**PERMIT NUMBER:** UT56281-1020  
**PERMITEE NAME:** City Of Belle Glade  
**EXPIRATION DATE:** 10/20/2021

- 1 . Improvements approved with this permit may be subject to removal due to Roadway Production's pending projects in the 5 year Road program.
- 2 . AFTER THE PERMIT CONDITIONS HAVE BEEN ACCEPTED BY THE PERMITTEE, HE/SHE SHALL CONTACT GRACIELA MCAUSLAND FOR PROJECTS NORTH OF STATE ROAD 80 AND SEAN REILLY FOR PROJECTS SOUTH OF STATE ROAD 80 AT THE PBC TRAFFIC DIVISION (561) 684-4030. THEY WILL DETERMINE IF MAINTENANCE OF TRAFFIC PLAN (FOR VEHICLES AND/OR PEDESTRIANS) IS REQUIRED. IF REQUIRED, THE PLAN SHALL BE SUBMITTED VIA EPERMITTING UNDER THE MAINTENANCE OF TRAFFIC APPLICATION. A MINIMUM OF 2 WEEKS PRIOR TO START OF CONSTRUCTION. THE PERMITTEE/DULY AUTHORIZED AGENT SHALL BE RESPONSIBLE TO HAVE THE PLAN APPROVED PRIOR TO CONSTRUCTION.

WHEN THE PLAN HAS BEEN APPROVED, OR DETERMINED NOT TO BE REQUIRED, THE PERMIT CONTACT, EITHER THE PERMITTEE OR THE ENGINEER OF RECORD, SHALL CONTACT THE CONSTRUCTION COORDINATION DIVISION AT (561) 684-4180, 48 HOURS BEFORE COMMENCEMENT OF WORK FOR A START DATE. (SEE CONDITION NUMBER 1 ON THE BACK OF THIS PERMIT)

- 3 . This condition applies to Advanced Wireless Infrastructure Pole installation permits that exclude the associated underground electric, fiber optics, cables and other types of service conduits required to operate the pole mounted communication system (s). These supporting service lines are required to be permitted by a separate permit (if not included in this approval). "Pole installation only permits" shall not be connected without the supporting underground infrastructure being permitted. Operation without the proper permits will result in the removal of illegally installed components by the permittee and suspension of the Antenna use until properly permitted.
  - . The Permittee is required to coordinate with the property's applicable Drainage District for all work proposed or drainage discharge into that District's rights of way or easements.
- 5 . This permit does not include approval of Maintenance of Traffic (MOT). Contact Graciela MCausland for projects north of Southern Blvd. or Sean Reilly for projects south of Southern Blvd., Construction Coordinators- Palm Beach County Traffic Division at 561-684-4030.
- 6 . Coordinate with the local utility providers and provide the clearances to existing utilities established by those agencies. At a minimum, maintain 4 feet of horizontal clearance between proposed underground facilities and existing utilities (wall to wall) and a minimum of 12 inches of vertical clearance.
- 7 . If necessary as part of the permitted work pothole and groundwater discharge ( dewatering ) locations shall be coordinated with the PBC Construction Coordination Division. Milling and resurfacing of the road pavement may be required due to the number of pothole locations. Avoid disturbing travel lane wheel paths if possible.

- 8 . The Permittee shall provide evidence of insurance to the Construction Coordination Division prior to receiving a construction start date, as required by Ordinance No. 2019-030, and as may be amended.

The Certificate Holder shall be:

Palm Beach County Land Development  
C/O Construction Coordination Division  
2300 N. Jog Road  
West Palm Beach, FL 33411

Under: DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES (Acord 101, additional Remarks Schedule):

The following must be added as Additional Insured for General Liability insurance:

Palm Beach County Board of County Commissioners, Its Employees, Agents and Contractors.

The limits of coverage of insurance required shall be not less than the following:

(a) Worker's Compensation and Employer's Liability Insurance

Worker's Compensation-Florida Statutory Requirements

Employer's Liability - \$100,000 each accident

- \$500,000 disease--policy limit

- \$100,000 disease--each employee

(b) Comprehensive General Liability

Bodily injury and property damage-

\$1,000,000 each occurrence

\$3,000,000 general aggregate

(c) Automobile Liability

Bodily injury and property damage-

\$1,000,000 combined single limit each accident

- 9 . Please note that future roadway construction may require relocation of these facilities at no expense to Palm Beach County.
- 10 . All inspections are scheduled through Construction Coordination (561) 684-4180 either by the permittee, the engineer of record or his/her representative, who must be present at the inspections. Prior to scheduling a final field review with Construction Coordination, the permittee shall submit to the Land Development Division a signed and sealed certification of completion from the Engineer-of-Record for the above work, referencing the permit number and indicating the work was completed in substantial accordance with the approved plans.
- 11 . All inspections are scheduled through Construction Coordination (561) 684-4180 either by the permittee, the engineer of record or his/her representative, who must be present at the inspections. Prior to scheduling a final field review with Construction Coordination, the Permittee shall submit to the Land Development Division a signed and sealed certification of completion from the Engineer-of-Record for the above work, referencing the permit number and indicating the work was completed in substantial accordance with the approved plans.
- If the Permittee is exempt from requirement to contract with a Professional Engineer for design, then the Permittee shall provide a certification of completion letter. The letter is not required to be signed and sealed by a Professional Engineer except in the case where a Professional Engineer is on staff and EOR for the usually exempt project.
- 12 . WORK SHALL NOT COMMENCE UNTIL THE PERMITTEE HAS REQUESTED AND RECEIVED APPROVAL FOR A START DATE FROM THE CONSTRUCTION COORDINATION DIVISION AT 561-684-4180.  
FAILURE TO BEGIN CONSTRUCTION ON THE START DATE WITHOUT 24 HOUR NOTIFICATION WILL RESULT IN A CANCELED PERMIT.  
IF WORK COMMENCES WITHOUT AN APPROVED START DATE OR ON AN ALTERNATIVE DATE WITHOUT PROPER NOTICE, THIS PERMIT SHALL BE CANCELED.
- 13 . All utility structures installed below grade, of any type, in the Palm Beach County right-of-way are required to have traffic bearing tops. This includes all valve boxes, meter boxes, hand holes, splice boxes, storm grates, manhole tops, traffic boxes etc. This requirement applies to structures within the sidewalks, grassed areas and/or pavement.

All pull boxes, hand holes, etc., in Palm Beach County Right-of-Way are to be a minimum of Tier 15, (15K design load/ 22.5K Test load) traffic bearing in locations that are subject to occasional traffic.. Pull boxes, hand holes, etc., in the roadway (deliberate vehicular traffic applications) are to be a minimum of AASHTO H 20.

- 14 . Permittee shall coordinate the proposed installation with the existing utilities in the permitted work area.
- 15 . The Permittee is responsible to contact Palm Beach County Department of Environmental Resources Management (561) 233-2400 to obtain any approvals that office may require due to the work proposed by this permit.

## CONDITIONS FOR RIGHT-OF-WAY CONSTRUCTION (UTILITIES)

1. The Construction Coordination Division shall be contacted 48 hours before commencement of work to establish the start date and establish a timeline when field review(s) of the work are required. Construction shall be done Monday through Friday. Weekend work shall be approved by Construction Coordination 48 hours before Saturday. Plans bearing the approval stamp of the County Engineer and the approved permit shall be at the work site. Work may proceed beyond the permit expiration date if a start date was established and work started prior to the permit expiration date. When work is complete and the engineer's certification of completion has been submitted to the Land Development Division, the permittee/representative/engineer (as applicable) shall schedule a final review with Construction Coordination Division. If a permitted project has been completed but does not require an engineer's certification, the permittee/representative (as applicable) shall submit a letter to the Land Development Division indicating the work is complete and ready for final field review. Land Development will notify the permittee/representative to schedule final field reviews with Construction Coordination.
  2. The permittee understands and agrees that the rights and privileges herein set out are granted only to the extent of the County's right, title and interest in the land to be entered upon and used by the permittee. THE PERMITTEE WILL AT ALL TIMES ASSUME ALL RISK AND FURTHER WILL INDEMNIFY, DEFEND, AND SAVE HARMLESS PALM BEACH COUNTY FROM AND AGAINST ALL LOSS, DAMAGE, COST OR EXPENSE ARISING IN ANY MANNER (INCLUDING ALL LITIGATION COSTS AND ATTORNEY FEES), ON ACCOUNT OF THE EXERCISE OR ATTEMPTED EXERCISE BY SAID PERMITTEE OF THE AFORESAID RIGHTS AND PRIVILEGES REGARDLESS OF THE APPORTIONMENT OF NEGLIGENCE OF THE PARTIES INVOLVED. THE PERMIT HOLDER, THEREFORE, AGREES TO INDEMNIFY THE COUNTY FOR THE COUNTY'S OWN NEGLIGENCE. It is specifically understood that the limits of this indemnification are the COUNTY'S statutory liability limits under Section 768.28, Florida Statute, or any successor legislation in effect at the issuance of said permit. The existing statutory limits under 768.28, Florida Statute are hereby recognized as the Statue ("Construction Contracts") should that statute be deemed to apply.
  - 2a. The following condition is applicable when the permittee is a governmental agency: That Agency shall indemnify, defend and hold County harmless against any actions, claims or damages arising out of Agency's negligence and Agency's exercise of the rights granted by this Agreement to the extent permitted by law. The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Section 768.28, Florida Statutes, nor shall the same be construed to constitute an agreement by Agency to indemnify County of County's negligence.
- Permittee assumes full responsibility to maintain all areas under construction safe for the public and to properly route and direct traffic through the construction area. All traffic control operations shall be done in accordance with the current *Manual on Uniform Traffic Control Devices* (Part VI). Supplements to this manual are the Florida Department of Transportation's Roadway and Traffic Design Standards (Index 600) and Standard Specifications for Road and Bridge Construction (latest edition). No obstruction of the travel lanes between 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m. Monday thru Friday, unless approved by the Palm Beach County Traffic Engineering Division. No time restrictions for local and subdivision roads, or for construction done Saturday or Sunday.
4. Florida Statute 336.048 - Temporary closing traveling lane of road: Whenever any road on the county road or city street system is repaired, reconstructed, or otherwise altered in a manner that necessitates the closing of one or more traveling lanes of the road for a period of time exceeding 2 hours, the party performing such work shall give notice to the appropriate local law enforcement agency within whose jurisdiction such road is located prior to commencing work on the project. However, when the closing of one or more lanes is required because of emergency conditions, such notice shall be waived.
  5. Permittee hereby acknowledges the COUNTY'S right to inspect the area governed by this permit at any time prior to final acceptance by the COUNTY to assure compliance with all plans and specifications. All reviews, however, shall be performed at the COUNTY'S discretion and are strictly to assure compliance with project plans and specifications. PERMITTEE HEREBY ACKNOWLEDGES THAT THE COUNTY VIA SAID REVIEWS IS NOT THE EMPLOYER, SUPERVISOR, PRINCIPAL OR AGENT OF PERMITTEE. Permittee is at all times an independent contractor with full responsibility for all obligations and responsibilities imposed under this permit and imposed by law.
  6. If a County maintained Thoroughfare Plan Road is open cut, the procedures in Land Development Division PPM EL-O-3605, including Form 3605.1 (Open Cut Restoration for Thoroughfare Plan Roads) shall be adhered to. If a Non-Thoroughfare Plan Road is open cut, Land Development Division PPM EL-O-3606, including Form 3606.1 (Open Cut Restoration for Non-Thoroughfare Plan Roads) shall be adhered to.
  - 6a. If an asphalt driveway is cut and patched, the entire driveway shall be overlaid with a minimum one inch of asphalt, or entirely replaced. If a concrete driveway is cut, it shall be entirely replaced. Replacement area is from the intersecting road to the property line.
  7. All areas in the right-of-way shall be left in a condition equal to or better than existed prior to construction. Shoulders disturbed within 8 feet of the edge of pavement shall be stabilized a minimum 50 PSI Florida Bearing Value, 6 inches in depth. Existing drainage shall not be impeded. Sidewalk areas disturbed during construction shall be maintained until repaved. Prior to or concurrent with final review, the permittee shall submit to the Construction Coordination Division copies of density reports done by an independent testing laboratory. If the construction should fail within one year from the date of final review by the

Construction Coordination Division, the permittee is responsible for restoration.

8. The permittee certifies notification has or will be given at least 48 hours (excluding Saturday, Sundays and legal holidays) prior to starting excavation, to anyone having the right to bury gas pipe line within the public or private street, alley, right-of-way or gas utility easement for purposes of obtaining information concerning the possible location of gas pipe lines in the area of proposed excavation.
9. The permitted work shall be coordinated with any Utility or Cable TV facilities in the area of construction.
10. The permittee/developer shall provide and install pavement markings (thermoplastic, unless approved otherwise by the Palm Beach County Traffic Engineer), and reflective pavement markers in accordance with Palm Beach County Traffic Division's latest Typicals for Pavement Markings, Signing and Geometrics.
11. If traffic signalization equipment is in the area of construction, notify Palm Beach County Traffic Operations at (561) 233-3900. Do not disturb any material within six feet of a traffic signal pole or a guy wire and anchor. If damage to the equipment occurs during construction, it shall be repaired by Traffic Operations at the permittee's expense.
12. Provide a minimum cover of 36 inches in the right-of-way of Thoroughfare Plan Roads and a minimum of 30 inches for all others. Maintain a minimum clearance of 12 inches over or under drainage facilities.
13. When plastic pipe is permitted for boring, it shall meet the standards as set forth in the latest Florida Department of Transportation Design Standards.
14. If previously approved construction is underway in the same location as indicated on this permit, the permittee shall obtain permission to work from the contractor doing the underway construction. If not granted, the construction under this permit shall not be done until the underway construction is finished by the Palm Beach County Construction Coordination Division.

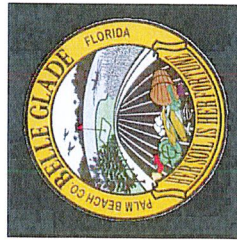
# APPENDIX D

PALM BEACH COUNTY  
WATER UTILITIES DEPARTMENT  
APPROVED PLANSET  
UTILITY EASEMENT FORM  
PRE-CONSTRUCTION MEETING CHECKLIST  
PROJECT COMPLETION REQUIREMENTS

# CONSTRUCTION PLANS FOR BELLE GLADE AIRPORT LIFT STATION

## PREPARED FOR THE CITY OF BELLE GLADE, FLORIDA

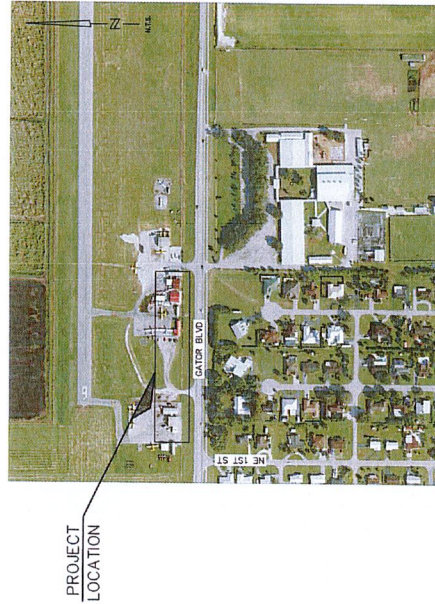
### NOVEMBER 2020



**TOWN OFFICIALS**

MAYOR  
VICE MAYOR  
TREASURER  
COMMISSIONER  
CITY MANAGER  
DIRECTOR OF PUBLIC WORKS

STEVE B. WILSON  
MARY ROSS WILKERSON  
MICHAEL C. MARTIN  
JOHNNY BURROUGHS, JR.  
LARRY UNDERWOOD  
LOMAX HARRELLE  
JOHNNY GOODEN



TOWNSHIP - 37  
RANGE - 43  
SECTION - 29

LOCATION MAP  
N.T.S.

**Kimley»Horn**

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.  
1920 MCGOWA WAY SUITE 200 WEST PALM BEACH, FL 33411  
PHONE: 561-845-0600 FAX: 561-862-8175  
WWW.KIMLEY-HORN.COM CA 00000595

BELLE GLADE AIRPORT  
LIFT STATION  
PREPARED FOR  
CITY OF BELLE GLADE

FLORIDA  
JUL

NOV. 2020  
SCALE: AS SHOWN  
DESIGNED BY: DAC  
DRAWN BY: RAR  
CHECKED BY: JRL

NO.	REVISIONS	DATE	BY



COVER SHEET

SHEET NUMBER  
G-1

#### INITIAL BACKFLOW TESTING

1. THE BACKFLOW TEST SHALL BE PERFORMED BY A LICENSED PLUMBING CONTRACTOR OR A LICENSED ENGINEER. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLORIDA PLUMBING CODE AND THE FLORIDA ENGINEERING CODE.
2. THE TEST SHALL BE PERFORMED ON THE LIFT STATION AND THE SEWER MAINS. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLORIDA PLUMBING CODE AND THE FLORIDA ENGINEERING CODE.

APPROVED

PALM BEACH COUNTY WATER UTILITIES DEPT.

2020

PREPARED, ENGINEERING DIVISION

PRE-WORK CONFERENCE REQUIRED

Approval is valid for one (1) year from date of approval.

ALL MATERIALS, CONSTRUCTION AND TESTING SHALL BE IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS OF THE FLORIDA PLUMBING CODE AND THE FLORIDA ENGINEERING CODE. ANY DEVIATIONS FROM THESE REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

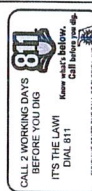
#### Sheet List Table

Sheet Number	Sheet Title
G-1	COVER SHEET
C-1	PARTIAL SITE PLAN - LIFT STATION AND WEST GRAVITY LATERAL
C-2	PARTIAL SITE PLAN - EAST GRAVITY LATERAL
C-3	LIFT STATION PLAN AND SECTION
C-4	CONSTRUCTION DETAILS
C-5	PBCWUD STANDARD WATER DETAILS
C-6	PBCWUD STANDARD SEWER DETAILS
C-7	PBCWUD STANDARD SEWER DETAILS
C-8	PBCWUD STANDARD SEWER DETAILS
E-1	ELECTRICAL NOTES & LEGENDS
E-2	ELECTRICAL SITE PLAN & ON-LINE DIAGRAM
E-3	LIFT STATION CONTROL PANEL DETAIL
E-4	CONTROL PANEL SCHEMATICS
E-5	ELECTRICAL DETAILS

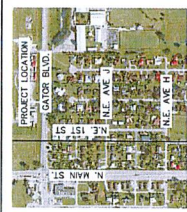
PRIOR TO THE CONNECTION TO AN EXISTING SEWER MAIN, THE CONTRACTOR SHALL VERIFY THE STATUS OF THE EXISTING SEWER MAIN. IF THE EXISTING SEWER MAIN IS NOT IN GOOD CONDITION, THE CONTRACTOR SHALL REPAIR OR REPLACE THE SEWER MAIN PRIOR TO THE CONNECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF BELLE GLADE AND THE PALM BEACH COUNTY WATER UTILITIES DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF BELLE GLADE AND THE PALM BEACH COUNTY WATER UTILITIES DEPARTMENT.

Call 561-740-4600 Ext. 1 in the event of change to gravity sewer force main, water main or reclaimed water lines owned by PBC Utilities

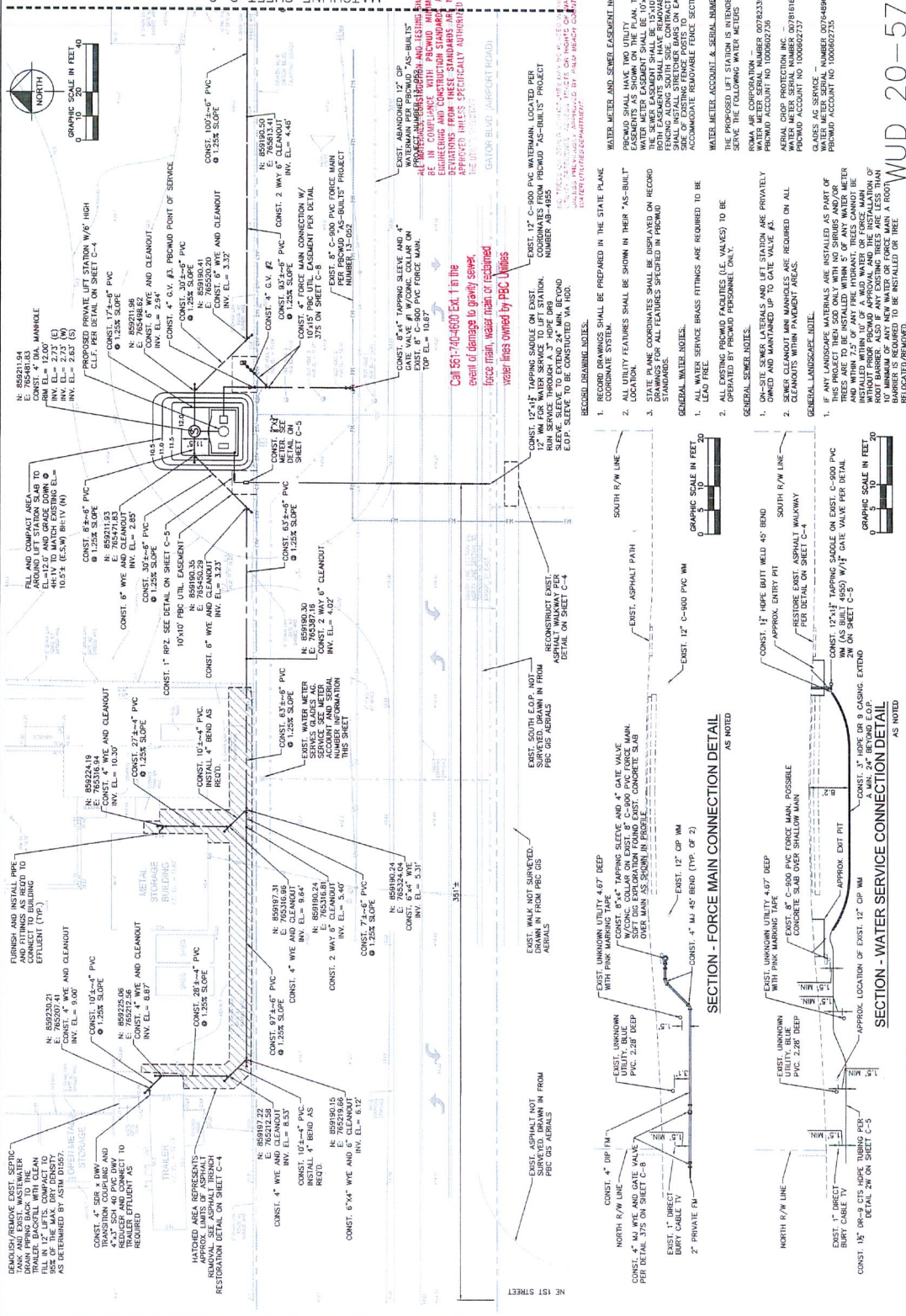
NO OTHER STRUCTURES SHALL BE PLACED WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF BELLE GLADE AND THE PALM BEACH COUNTY WATER UTILITIES DEPARTMENT.



WUD 20-579

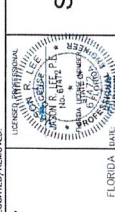


LOCATION MAP  
TOWNSHIP - 37  
RANGE - 43  
SECTION - 29



811  
CALL 2 WORKING DAYS  
BEFORE YOU DIG  
IT'S THE LAW  
DIAL 811  
Call before you dig  
www.811.org

WUD 20-579  
PARTIAL SITE PLAN - LIFT  
STATION AND WEST GRAVITY  
LATERAL



BELLE GLADE AIRPORT  
LIFT STATION  
PREPARED FOR  
CITY OF BELLE GLADE

Kimley-Horn  
1320 KNOX WAY SUITE 200, WEST PALM BEACH, FL 33411  
PHONE: 561-845-0865 FAX: 561-863-8175  
WWW.KIMLEY-HORN.COM CA 16000696

NO.	REVISIONS	DATE	BY

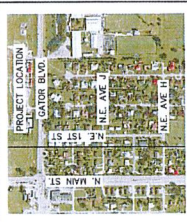
- CONSTRUCTION NOTES:
- THE PLUMBING WITHIN THE BUILDING IS NOT KNOWN. GLAZES AS SERVICE METAL PLUMBING EFFLUENT OUTSIDE OF THE BUILDING. DETERMINE THE EXISTING PLUMBING EFFLUENT ELEVATION AND LOCATION PRIOR TO LIFT STATION LATERAL TO SERVE THE BUILDING WITHIN THE GLADES.
  - ALL MATERIALS TO BE DELIVERED TO BE DISPOSED OF LEGALLY OFF-SITE.
  - LOCATIONS OF EXISTING SHOWN ON THE DRAWINGS ARE BASED ON THE RECORD DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AS REQUIRED.
  - ALL PVC GRAVITY SEWER PIPE SHALL BE SDR 35 UNLESS OTHERWISE NOTED.
  - CONTRACTOR SHALL PROVIDE ALL RECORD ELEVATIONS FOR THE EXISTING LATERAL TO THE 15'x15' AREA AT THE LIFT STATION. ALL EXISTING LATERAL TO BE REPLACED WITH 12" CPVC OFF-SITE AND REPLACED WITHIN THE UPPER 30' OF THE PROJECT AREA.
  - A GEOTECHNICAL ENGINEERING REPORT IS REQUIRED FOR THE PROJECT AND IS INCLUDED IN THE SPECIFICATIONS.
  - ALL 500' LANDSCAPING BY BRIGGAS IMPACTED BY THE PROJECT. CONTRACTOR SHALL COORDINATE WITH THE BRIGGAS CONTRACTOR FOR REPLACEMENT OF THE BRIGGAS SYSTEM FOLLOWING OPERATIONAL TEST.
  - ALL AREAS IMPACTED BY CONSTRUCTION WILL REQUIRE CONSTRUCTION SPECIFICATIONS.
  - ALL GATE VALVES SHALL HAVE CONCRETE COLLARS PER DETAIL ON SHEET C-8.

- GENERAL NOTES:
- ON-SITE SEWER LATERALS AND LIFT STATION ARE PRIVATELY OWNED AND MAINTAINED UP TO GATE VALVE #3.
  - SEWER CLEANOUT MINI MANHOLES ARE REQUIRED ON ALL LATERALS WITHIN PAVEMENT AREAS.
  - IF ANY LANDSCAPE MATERIALS ARE INSTALLED AS PART OF THIS PROJECT THEN 500' ONLY WITH NO SHRUBS AND/OR TREES WITHIN 10' OF A ROAD OR WATER OR FORCE MAIN OF ANY TYPE. ALL EXISTING TREES ARE LESS THAN 10' IN DBH. A ROOT BARRIER IS REQUIRED TO BE INSTALLED ON TREE RELOCATED/REMOVED.

- GENERAL WATER NOTES:
- ALL WATER SERVICE BRASS FITTINGS ARE REQUIRED TO BE LEAD FREE.
  - ALL EXISTING PROMIO FACILITIES (I.E. VALVES) TO BE OPERATED BY PROMIO PERSONNEL ONLY.

- RECORD DRAWINGS SHALL BE PREPARED IN THE STATE PLANE COORDINATE SYSTEM.
- ALL UTILITY FEATURES SHALL BE SHOWN IN THEIR "AS-BUILT" LOCATION.
  - STATE PLANE COORDINATES SHALL BE DISPLAYED ON RECORD DRAWINGS. ALL FEATURES SPECIFIED IN PROMIO STANDARDS.

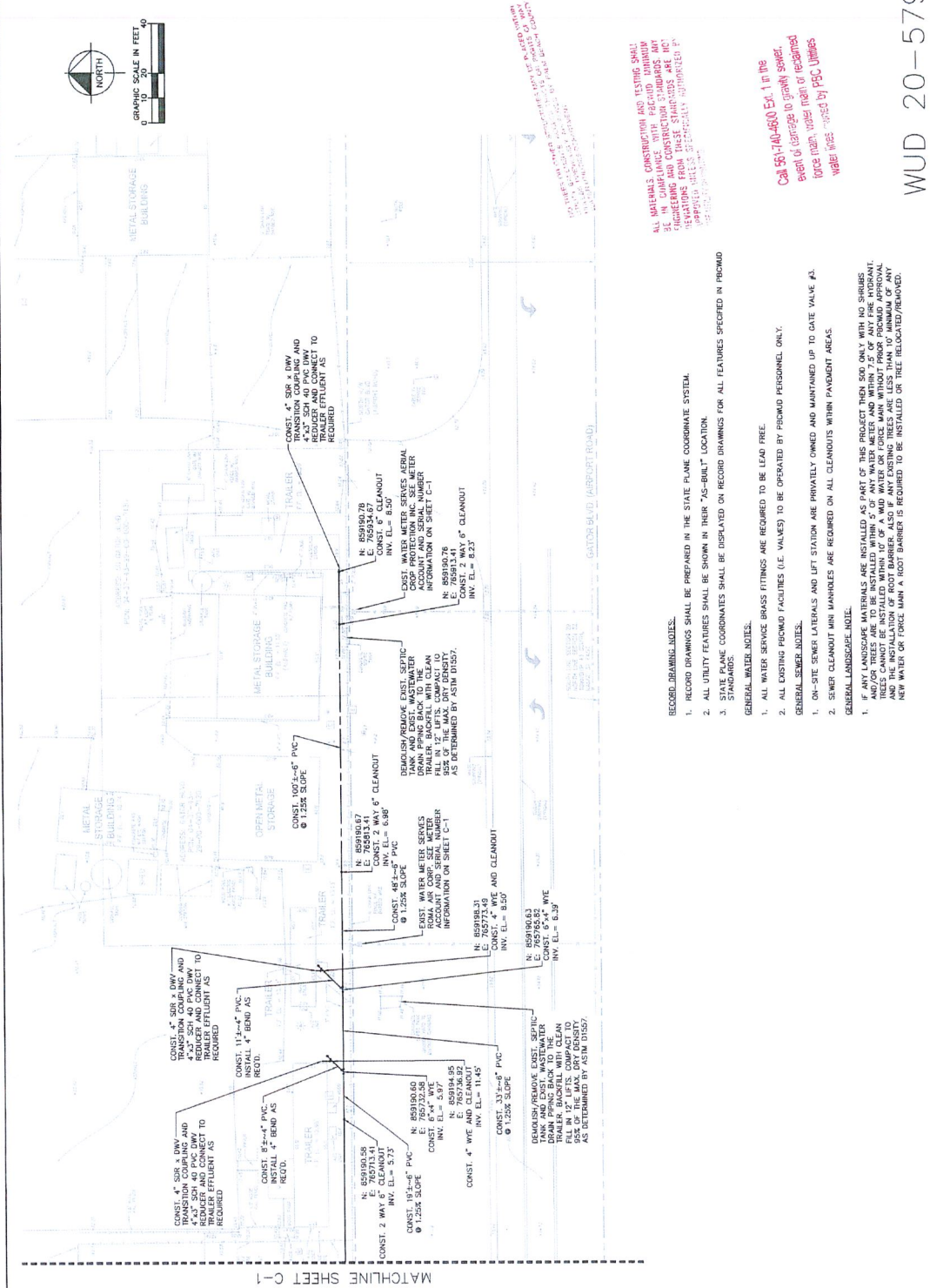
- SECTION - FORCE MAIN CONNECTION DETAIL
- AS NOTED
- SECTION - WATER SERVICE CONNECTION DETAIL



LOCATION MAP  
TOWNSHIP - 37  
RANGE - 43  
SECTION - 29

- CONSTRUCTION NOTES:
- THE PLUMBING WITHIN THE GRADES AS SERVICE METAL SHALL BE INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL LOCATE THE PLUMBING EFFLUENT OUTSIDE OF THE EXISTING BUILDING AND DETERMINE THE EXISTING MATERIAL AND INVERT ELEVATION AND LOCATE PROPOSED SEWER LATERAL TO SERVE THE EXISTING BUILDING. ALL GRADES AS SERVICE METAL BUILDINGS SHALL BE DEMOLISHED TO BE DISPOSED OF LOCALLY OFF-SITE.
  - ALL MATERIALS TO BE DEMOLISHED TO BE DISPOSED OF LOCALLY OFF-SITE.
  - EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION. UNUSUAL CONDITIONS AS REQUIRED.
  - ALL PVC GRAVITY SEWER PIPE SHALL BE 15' MINIMUM UNLESS OTHERWISE NOTED.
  - CONTRACTOR SHALL REMOVE ALL MUCK ENCOUNTERED WITHIN THE EXISTING BUILDING AND THE PIPE INSTALLATIONS AND THE 35,000 AREA AT THE LIFT STATION TO BE DISPOSED OF LOCALLY OFF-SITE. ALL MUCK WITHIN CLEAN FALL MUCK IS ANTIPOATED WITHIN THE UPPER 12" OF THE EXISTING MUCK.
  - ALL EXISTING ENGINEERING PROJECT AND IS INCLUDED IN THE STUDY WAS COMPLETED FOR THE PROJECT AND IS INCLUDED IN THE RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION. UNUSUAL CONDITIONS AS REQUIRED.
  - ALL SOD, LANDSCAPING AND PLANTING SHALL BE REPLACED IN KIND. CONTRACTOR SHALL MAINTAIN ALL EXISTING PLANTING AND CITY TO OPERATE PLANTING SYSTEMS WITHIN OPERATIONAL TEST.
  - ALL AREAS IMPACTED BY CONSTRUCTION SHALL BE RECLAIMED TO ORIGINAL CONDITION. ALL GATE VALVES SHALL HAVE 12" MINIMUM CLEARANCE PER DETAIL ON SHEET C-1.

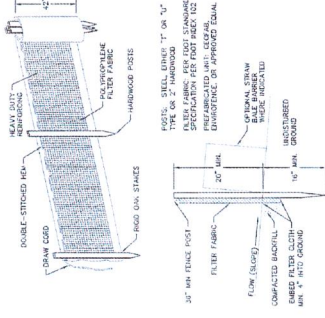
CALL 2 WORKING DAYS BEFORE YOU DIG  
IT'S THE LAW!  
DAL 811  
Know what's below.  
Call before you dig.  
811  
FLORIDA  
UNIFORM SERVICE CALL OF FLORIDA, INC.



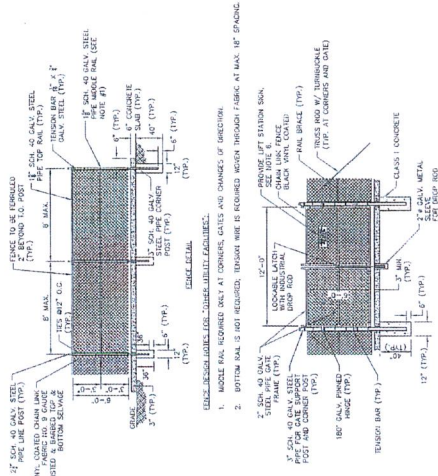
WUD 20-579

SHEET NUMBER <b>C-2</b>	
PARTIAL SITE PLAN - EAST GRAVITY LATERAL	
Belle Glade Airport LIFT STATION PREPARED FOR CITY OF BELLE GLADE	
FLORIDA DATE: 11/15/2020	
N/A PROJECT 144080023 NOV. 2020 SCALE AS SHOWN DESIGNED BY: DAC DRAWN BY: HAE CHECKED BY: JRL	
<b>Kimley»Horn</b> © 2020 KIMLEY-HORN AND ASSOCIATES, INC. 1820 WEST PALM BEACH, FL 33411 PHONE: 561-863-0855 FAX: 561-863-8175 WWW.KIMLEY-HORN.COM CA 00000888	
REVISIONS	DATE BY

[illegible]



**CHAIN LINK FENCE AT LIFT STATION DETAIL**  
N.T.S.



- NOTES:**
1. BLACK VINYL COATING IS REQUIRED FOR ALL FENCE FABRIC, ALL POSTS, BRACES, RAILS, AND ACCESSORIES.
  2. ALL POSTS SHALL BE CAPPED WITH GALVANIZED STEEL TOPS. LINE POST TOPS SHALL PROVIDE FOR PASSAGE OF TOP RAIL.
  3. ALL WELDED JOINTS SHALL BE COATED WITH A 2 PART EPOXY PAINT.
  4. RAIL SPACES TO BE LOCATED WITHIN 17\"/>

**CHAIN LINK FENCE AT LIFT STATION DETAIL**  
N.T.S.

**Kimley»Horn**

© 2019 KIMLEY-HORN AND ASSOCIATES, INC. 03411  
14201 84TH AVE. SUITE 200, WESTON, MA 02459-1620  
PH: 508.853.1100 FAX: 508.853.1101  
WWW.KIMLEY-HORN.COM CA 06262626

DATE: 11/14/2019  
BY: JH  
CHECKED BY: JH  
DESIGNED BY: JH  
PROJECT NO.: 19-001

**BELLE GLADE AIRPORT  
LIFT STATION**  
PREPARED FOR  
CITY OF BELLE GLADE

DATE: 11/14/2019  
BY: JH  
CHECKED BY: JH  
DESIGNED BY: JH  
PROJECT NO.: 19-001

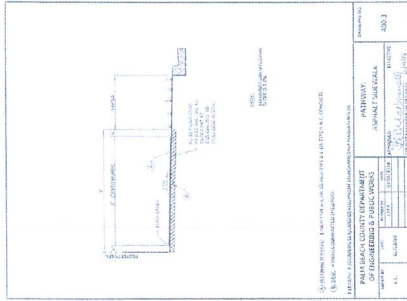
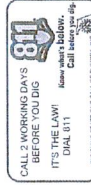


**CONSTRUCTION DETAILS**

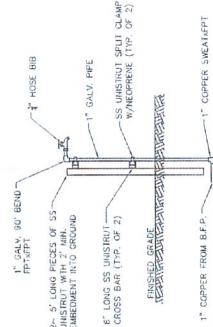
C-4

SHEET NUMBER

WUD 20-579



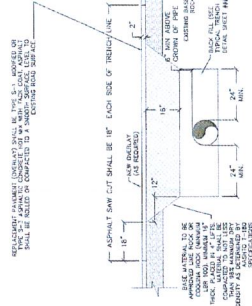
**TRENCH - PAVEMENT RESTORATION DETAIL**  
NOT TO BE USED IN PALM BEACH COUNTY RIGHT-OF-WAY N.T.S.



- NOTES:**
1. ALL ABOVE GRADE PIPE AND FITTINGS SHALL GALV. STEEL.
  2. ALL JOINTS SHALL BE THREADED.
  3. ALL HARDWARE TO BE 316 STAINLESS STEEL.

**HOSE BIB DETAIL**  
N.T.S.

- NOTES:**
1. THE SLOPE SHALL BE MAINTAINED TO MAINTAIN THE EXISTING SURFACE.
  2. THE SLOPE SHALL BE MAINTAINED TO MAINTAIN THE EXISTING SURFACE.
  3. THE SLOPE SHALL BE MAINTAINED TO MAINTAIN THE EXISTING SURFACE.
  4. THE SLOPE SHALL BE MAINTAINED TO MAINTAIN THE EXISTING SURFACE.



REINFORCEMENT FABRIC (MINIMUM 12\"/>

PROJECT NO.  
042095001

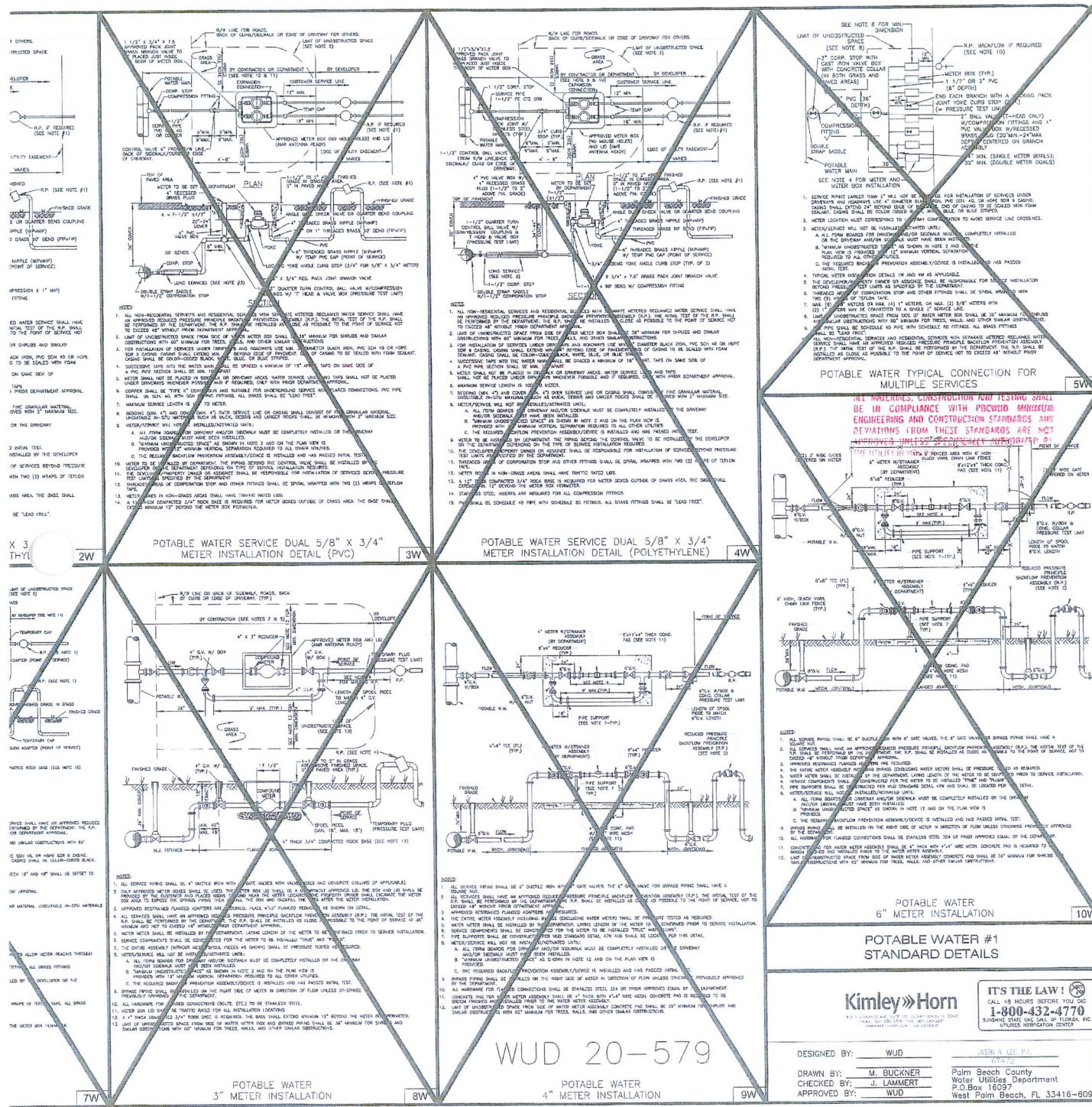
BELLE GLADE AIRPORT  
LIFT STATION  
PREPARED FOR  
CITY OF BELLE GLADE



PALM BEACH COUNTY  
WATER UTILITIES DEPARTMENT  
P.O. BOX 16097  
WEST PALM BEACH, FL 33416  
(561) 963-6000

NO.	DATE	REVISION / REMARKS
1	JUNE 2013	1. GENERAL REVISION

STD  
DETAILS  
SHEET  
NUMBER  
C-5

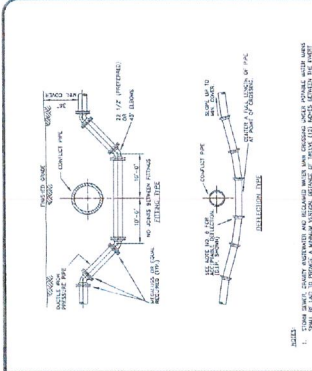


Kimley»Horn

DESIGNED BY: WUD  
DRAWN BY: M. BUCKNER  
CHECKED BY: J. LAMBERT  
APPROVED BY: WUD

IT'S THE LAW!  
CALL 48 HOURS BEFORE YOU DO  
1-800-432-4770  
Belle Glade Lift Station, Inc.  
WEST PALM BEACH, FL 33416-6097

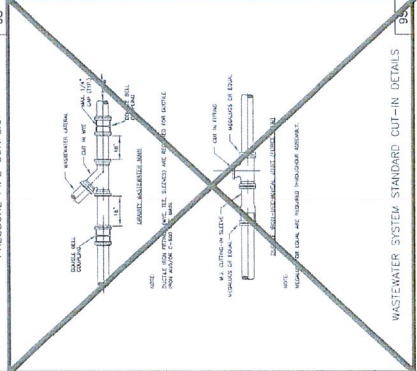
WUD 20-579



**ALL MATERIALS, CONSTRUCTION AND TESTING SHALL BE IN COMPLIANCE WITH PRECIPRO MINIMUM ENGINEERING AND CONSTRUCTION STANDARDS ANY DEVIATIONS FROM THESE STANDARDS ARE NOT PERMITTED.**

**POTABLE WATER MAIN/FORCE MAIN PRESSURE PIPE CONFLICT**

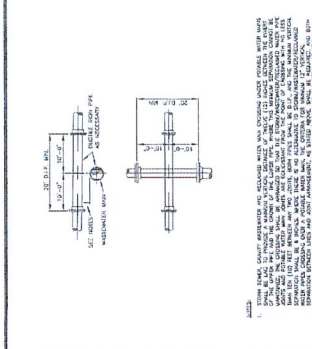
1. FORCE MAIN SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



**WASTEWATER SYSTEM STANDARD CUT-IN DETAILS**

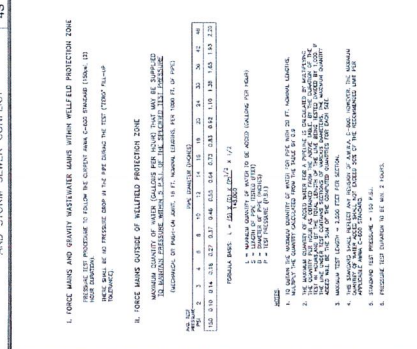
**WASTEWATER #1 STANDARD DETAILS**

DESIGNED BY: WUD  
DRAWN BY: J. LAMBERT  
CHECKED BY: J. LAMBERT  
APPROVED BY: WUD



**POTABLE WATER MAIN, WASTEWATER MAIN, AND STORM SEWER CONFLICT**

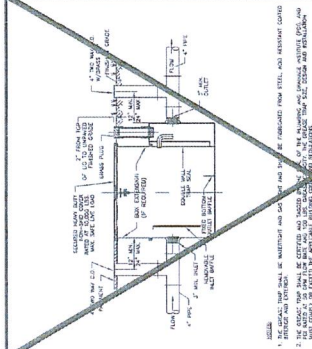
1. FORCE MAIN AND GRAVITY WASTEWATER MAINS WITHIN WELL FIELD PROTECTION ZONE SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



**WUD 20-579**

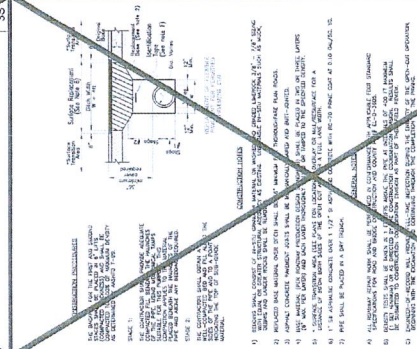
**PRESSURE TEST CRITERIA FOR GRAVITY WASTEWATER MAIN IN WELL FIELD & FORCE MAIN**

1. FORCE MAIN SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



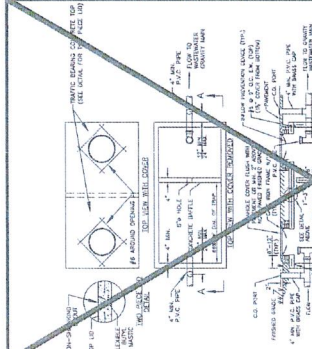
**GREASE TRAP**

1. GREASE TRAP SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



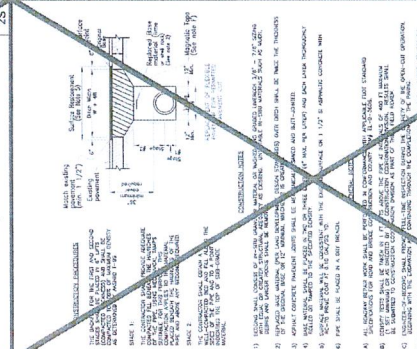
**OPEN CUT PIPE INSTALLATION THROUGHFARE ROAD**

1. OPEN CUT PIPE SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



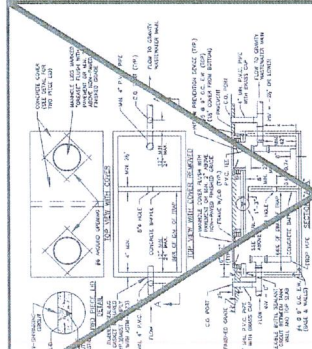
**SAND/OIL INTERCEPTOR**

1. SAND/OIL INTERCEPTOR SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



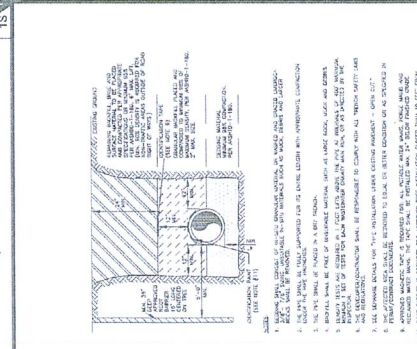
**OPEN CUT PIPE INSTALLATION NON-THROUGHFARE ROAD**

1. OPEN CUT PIPE SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



**ON / GREASE INTERCEPTOR**

1. ON / GREASE INTERCEPTOR SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>



**TYPICAL TRENCH DETAIL FOR BARRIER INSTALLATION**

1. TYPICAL TRENCH DETAIL FOR BARRIER INSTALLATION SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM COVER OF 48\"/>

BELLE GLADE AIRPORT  
LIFT STATION  
PREPARED FOR  
CITY OF BELLE GLADE



PALM BEACH COUNTY  
CR UTILITIES DEPARTMENT  
P.O. BOX 16097  
WEST PALM BEACH, FL 33416  
(561)493-6000

[illegible]

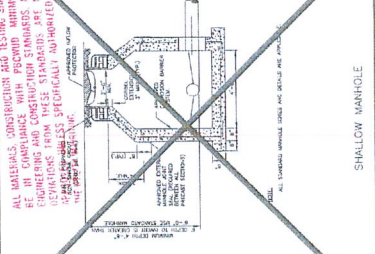
STD  
DETAILS  
SHEET

NUMBER  
C-7

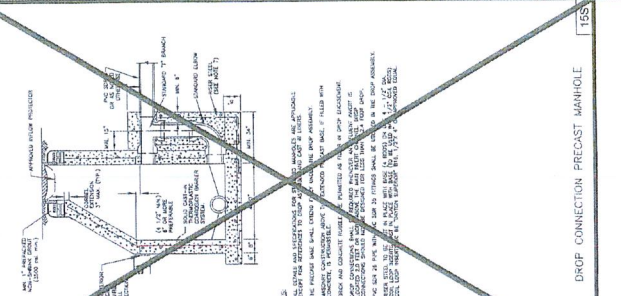
WUD 20-579  
GRAVITY SEWER MANHOLE FRAME & COVER

	STATION NUMBER	670800
	WATER NAME	

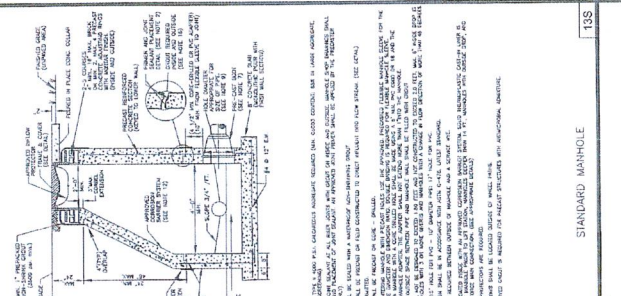
- [illegible]



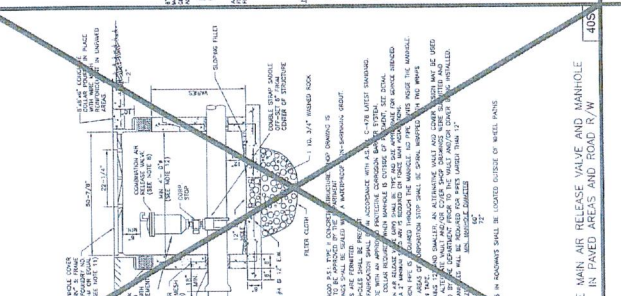
1



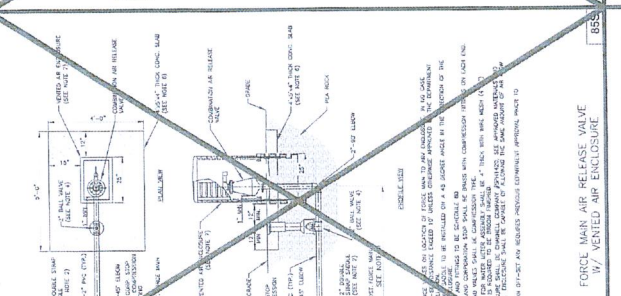
1000



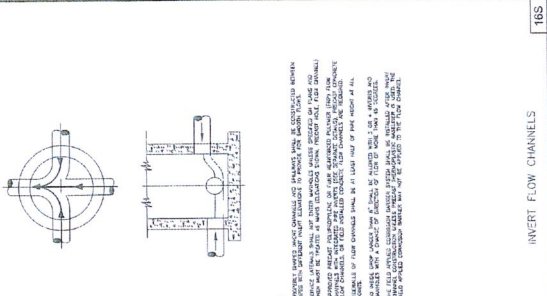
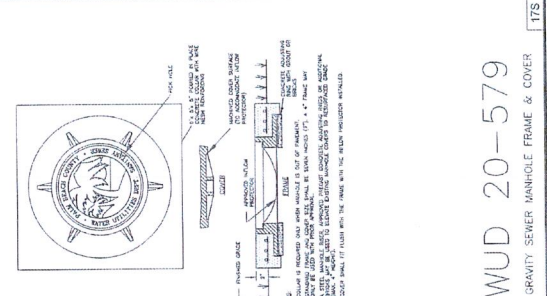
---



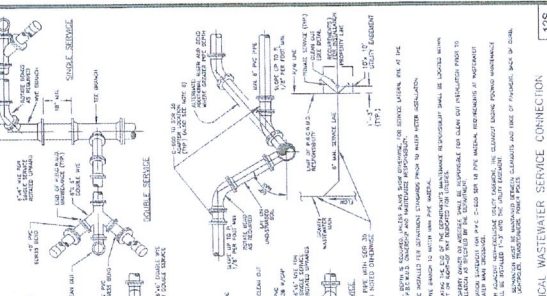
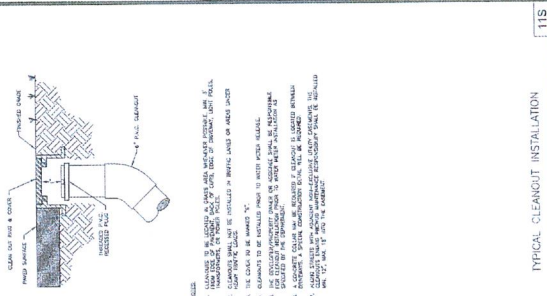
---



1



10


$$f(x) = \begin{cases} 1 & \text{if } x \in \mathbb{Q} \\ 0 & \text{if } x \notin \mathbb{Q} \end{cases}$$


PROJECT NO.  
04205001

BELLE GLADE AIRPORT  
LIFT STATION  
REPAIRED FOR  
CITY OF BELLE GLADE



PALM BEACH COUNTY  
WATER UTILITIES DEPARTMENT  
120 N. MILITARY BLVD., SUITE 100  
WEST PALM BEACH, FL 33416  
(561) 838-6000

NO.	DATE	BY	REVISION
1	04/18/19	J. J. JAMBERT	GENERAL REVISION
2	04/18/19	J. J. JAMBERT	REVISION

SHEET  
C-8  
DETAILS



NEW LENGTH OF PIPE (FEET) TO BE REPAIRED			
DOWNSIDE FROM EXISTING MANHOLE TO EXISTING MANHOLE			
MANHOLE NO.	MANHOLE ELEVATION	PIPE SIZE	PIPE LENGTH (FEET)
1	10.00	12"	10.00
2	9.50	12"	10.00
3	9.00	12"	10.00
4	8.50	12"	10.00
5	8.00	12"	10.00
6	7.50	12"	10.00
7	7.00	12"	10.00
8	6.50	12"	10.00
9	6.00	12"	10.00
10	5.50	12"	10.00
11	5.00	12"	10.00
12	4.50	12"	10.00
13	4.00	12"	10.00
14	3.50	12"	10.00
15	3.00	12"	10.00
16	2.50	12"	10.00
17	2.00	12"	10.00
18	1.50	12"	10.00
19	1.00	12"	10.00
20	0.50	12"	10.00
21	0.00	12"	10.00
22	-0.50	12"	10.00
23	-1.00	12"	10.00
24	-1.50	12"	10.00
25	-2.00	12"	10.00
26	-2.50	12"	10.00
27	-3.00	12"	10.00
28	-3.50	12"	10.00
29	-4.00	12"	10.00
30	-4.50	12"	10.00
31	-5.00	12"	10.00
32	-5.50	12"	10.00
33	-6.00	12"	10.00
34	-6.50	12"	10.00
35	-7.00	12"	10.00
36	-7.50	12"	10.00
37	-8.00	12"	10.00
38	-8.50	12"	10.00
39	-9.00	12"	10.00
40	-9.50	12"	10.00
41	-10.00	12"	10.00
42	-10.50	12"	10.00
43	-11.00	12"	10.00
44	-11.50	12"	10.00
45	-12.00	12"	10.00
46	-12.50	12"	10.00
47	-13.00	12"	10.00
48	-13.50	12"	10.00
49	-14.00	12"	10.00
50	-14.50	12"	10.00
51	-15.00	12"	10.00
52	-15.50	12"	10.00
53	-16.00	12"	10.00
54	-16.50	12"	10.00
55	-17.00	12"	10.00
56	-17.50	12"	10.00
57	-18.00	12"	10.00
58	-18.50	12"	10.00
59	-19.00	12"	10.00
60	-19.50	12"	10.00
61	-20.00	12"	10.00
62	-20.50	12"	10.00
63	-21.00	12"	10.00
64	-21.50	12"	10.00
65	-22.00	12"	10.00
66	-22.50	12"	10.00
67	-23.00	12"	10.00
68	-23.50	12"	10.00
69	-24.00	12"	10.00
70	-24.50	12"	10.00
71	-25.00	12"	10.00
72	-25.50	12"	10.00
73	-26.00	12"	10.00
74	-26.50	12"	10.00
75	-27.00	12"	10.00
76	-27.50	12"	10.00
77	-28.00	12"	10.00
78	-28.50	12"	10.00
79	-29.00	12"	10.00
80	-29.50	12"	10.00
81	-30.00	12"	10.00
82	-30.50	12"	10.00
83	-31.00	12"	10.00
84	-31.50	12"	10.00
85	-32.00	12"	10.00
86	-32.50	12"	10.00
87	-33.00	12"	10.00
88	-33.50	12"	10.00
89	-34.00	12"	10.00
90	-34.50	12"	10.00
91	-35.00	12"	10.00
92	-35.50	12"	10.00
93	-36.00	12"	10.00
94	-36.50	12"	10.00
95	-37.00	12"	10.00
96	-37.50	12"	10.00
97	-38.00	12"	10.00
98	-38.50	12"	10.00
99	-39.00	12"	10.00
100	-39.50	12"	10.00
101	-40.00	12"	10.00
102	-40.50	12"	10.00
103	-41.00	12"	10.00
104	-41.50	12"	10.00
105	-42.00	12"	10.00
106	-42.50	12"	10.00
107	-43.00	12"	10.00
108	-43.50	12"	10.00
109	-44.00	12"	10.00
110	-44.50	12"	10.00
111	-45.00	12"	10.00
112	-45.50	12"	10.00
113	-46.00	12"	10.00
114	-46.50	12"	10.00
115	-47.00	12"	10.00
116	-47.50	12"	10.00
117	-48.00	12"	10.00
118	-48.50	12"	10.00
119	-49.00	12"	10.00
120	-49.50	12"	10.00
121	-50.00	12"	10.00
122	-50.50	12"	10.00
123	-51.00	12"	10.00
124	-51.50	12"	10.00
125	-52.00	12"	10.00
126	-52.50	12"	10.00
127	-53.00	12"	10.00
128	-53.50	12"	10.00
129	-54.00	12"	10.00
130	-54.50	12"	10.00
131	-55.00	12"	10.00
132	-55.50	12"	10.00
133	-56.00	12"	10.00
134	-56.50	12"	10.00
135	-57.00	12"	10.00
136	-57.50	12"	10.00
137	-58.00	12"	10.00
138	-58.50	12"	10.00
139	-59.00	12"	10.00
140	-59.50	12"	10.00
141	-60.00	12"	10.00
142	-60.50	12"	10.00
143	-61.00	12"	10.00
144	-61.50	12"	10.00
145	-62.00	12"	10.00
146	-62.50	12"	10.00
147	-63.00	12"	10.00
148	-63.50	12"	10.00
149	-64.00	12"	10.00
150	-64.50	12"	10.00
151	-65.00	12"	10.00
152	-65.50	12"	10.00
153	-66.00	12"	10.00
154	-66.50	12"	10.00
155	-67.00	12"	10.00
156	-67.50	12"	10.00
157	-68.00	12"	10.00
158	-68.50	12"	10.00
159	-69.00	12"	10.00
160	-69.50	12"	10.00
161	-70.00	12"	10.00
162	-70.50	12"	10.00
163	-71.00	12"	10.00
164	-71.50	12"	10.00
165	-72.00	12"	10.00
166	-72.50	12"	10.00
167	-73.00	12"	10.00
168	-73.50	12"	10.00
169	-74.00	12"	10.00
170	-74.50	12"	10.00
171	-75.00	12"	10.00
172	-75.50	12"	10.00
173	-76.00	12"	10.00
174	-76.50	12"	10.00
175	-77.00	12"	10.00
176	-77.50	12"	10.00
177	-78.00	12"	10.00
178	-78.50	12"	10.00
179	-79.00	12"	10.00
180	-79.50	12"	10.00
181	-80.00	12"	10.00
182	-80.50	12"	10.00
183	-81.00	12"	10.00
184	-81.50	12"	10.00
185	-82.00	12"	10.00
186	-82.50	12"	10.00
187	-83.00	12"	10.00
188	-83.50	12"	10.00
189	-84.00	12"	10.00
190	-84.50	12"	10.00
191	-85.00	12"	10.00
192	-85.50	12"	10.00
193	-86.00	12"	10.00
194	-86.50	12"	10.00
195	-87.00	12"	10.00
196	-87.50	12"	10.00
197	-88.00	12"	10.00
198	-88.50	12"	10.00
199	-89.00	12"	10.00
200	-89.50	12"	10.00
201	-90.00	12"	10.00
202	-90.50	12"	10.00
203	-91.00	12"	10.00
204	-91.50	12"	10.00
205	-92.00	12"	10.00
206	-92.50	12"	10.00
207	-93.00	12"	10.00
208	-93.50	12"	10.00
209	-94.00	12"	10.00
210	-94.50	12"	10.00
211	-95.00	12"	10.00
212	-95.50	12"	10.00
213	-96.00	12"	10.00
214	-96.50	12"	10.00
215	-97.00	12"	10.00
216	-97.50	12"	10.00
217	-98.00	12"	10.00
218	-98.50	12"	10.00
219	-99.00	12"	10.00
220	-99.50	12"	10.00
221	-100.00	12"	10.00
222	-100.50	12"	10.00
223	-101.00	12"	10.00
224	-101.50	12"	10.00
225	-102.00	12"	10.00
226	-102.50	12"	10.00
227	-103.00	12"	10.00
228	-103.50	12"	10.00
229	-104.00	12"	10.00
230	-104.50	12"	10.00
231	-105.00	12"	10.00
232	-105.50	12"	10.00
233	-106.00	12"	10.00
234	-106.50	12"	10.00
235	-107.00	12"	10.00
236	-107.50	12"	10.00
237	-108.00	12"	10.00
238	-108.50	12"	10.00
239	-109.00	12"	10.00
240	-109.50	12"	10.00
241	-110.00	12"	10.00
242	-110.50	12"	10.00
243	-111.00	12"	10.00
244	-111.50	12"	10.00
245	-112.00	12"	10.00
246	-112.50	12"	10.00
247	-113.00	12"	10.00
248	-113.50	12"	10.00
249	-114.00	12"	10.00
250	-114.50	12"	10.00
251	-115.00	12"	10.00
252	-115.50	12"	10.00
253	-116.00	12"	10.00
254	-116.50	12"	10.00
255	-117.00	12"	10.00
256	-117.50	12"	10.00
257	-118.00	12"	10.00
258	-118.50	12"	10.00
259	-119.00	12"	10.00
260	-119.50	12"	10.00
261	-120.00	12"	10.00
262	-120.50	12"	10.00
263	-121.00	12"	10.00
264	-121.50	12"	10.00
265	-122.00	12"	10.00
266	-122.50	12"	10.00
267	-123.00	12"	10.00
268	-123.50	12"	10.00
269	-124.00	12"	10.00
270	-124.50	12"	10.00
271	-125.00	12"	10.00
272	-125.50	12"	10.00
273	-126.00	12"	10.00
274	-126.50	12"	10.00
275	-127.00	12"	10.00
276	-127.50	12"	10.00
277	-128.00	12"	10.00
278	-128.50	12"	10.00
279	-129.00	12"	10.00
280	-129.50	12"	10.00
281	-130.00	12"	10.00
282	-130.50	12"	10.00
283	-131.00	12"	10.00
284	-131.50	12"	10.00
285	-132.00	12"	10.00
286	-132.50	12"	10.00
287	-133.00	12"	10.00
288	-133.50	12"	10.00
289	-134.00	12"	10.00
290	-134.50	12"	10.00
291	-135.00	12"	10.00
292	-135.50	12"	10.00
293	-136.00	12"	10.00
294	-136.50	12"	10.00
295	-137.00	12"	10.00
296	-137.50	12"	10.00
297	-138.00	12"	10.00
298	-138.50	12"	10.00
299	-139.00	12"	10.00
300	-139.50	12"	10.00
301	-140.00	12"	10.00
302	-140.50	12"	10.00
303	-141.00	12"	10.00
304	-141.50	12"	10.00
305	-142.00	12"	10.00
306	-142.50	12"	10.00
307	-143.00	12"	10.00
308	-143.50	12"	10.00
309	-144.00	12"	10.00
310	-144.50	12"	10.00
311	-145.00	12"	10.00
312	-145.50	12"	10.00
313	-146.00	12"	10.00
314	-146.50	12"	10.00
315	-147.00	12"	10.00
316	-147.50	12"	10.00
317	-14		

Prepared by and Return to:  
Palm Beach County Water Utilities Department  
8100 Forest Hill Boulevard,  
ATTN: Plan Review, Engineering Section  
West Palm Beach, Florida 33413

### UTILITY EASEMENT

**THIS EASEMENT** is made, granted and entered into this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
by \_\_\_\_\_ (hereinafter referred to as "Grantor"), whose address is  
\_\_\_\_\_, to Palm Beach County (hereinafter referred to  
as "Grantee"), c/o Water Utilities Department, 8100 Forest Hill Boulevard, West Palm Beach, Florida 33413.

### WITNESSETH

That Grantor, for and in consideration of the sum of Ten Dollars (\$10.00) in hand paid by the Grantee and other good and valuable consideration, the receipt of which is hereby acknowledged, does hereby grant to the Grantee, its successors and assigns, a perpetual utility easement which shall permit Grantee authority to enter upon the property of the Grantor at any time to install, operate, maintain, service, construct, reconstruct, remove, relocate, repair, replace, improve, expand, tie into, and inspect potable water, reclaimed water and/or wastewater lines and appurtenant facilities and equipment in, on, over, under and across the easement premises. This utility easement or portion thereof can also be utilized for a wastewater pump station and may be fenced in by the Grantee for access control purposes. The easement hereby granted covers a strip of land lying, situate and being in Palm Beach County, Florida, and being more particularly described as follows:

### SEE EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF

Grantor hereby covenants with Grantee that it is lawfully seized and in possession of the real property herein described and that it has good and lawful right to grant the aforesaid easement free and clear of mortgages and other encumbrances unless specifically stated to the contrary.

**IN WITNESS WHEREOF**, the Grantor has hereunto set its hand and affixed its seal as of the date first above written.

### WITNESSES:

Signed, sealed and delivered  
in the presence of:

\_\_\_\_\_  
Witness Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Witness Signature

\_\_\_\_\_  
Print Name

### GRANTOR:

By: \_\_\_\_\_

\_\_\_\_\_  
Print Name

By: \_\_\_\_\_

\_\_\_\_\_  
Print Name

**NOTARY CERTIFICATE**

**STATE OF** \_\_\_\_\_  
**COUNTY OF** \_\_\_\_\_

The foregoing instrument was acknowledged before me by means of physical presence or online  
notarization, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
by \_\_\_\_\_ (name of person acknowledging).

My Commission

Expires: \_\_\_\_\_

\_\_\_\_\_  
Signature of Notary

\_\_\_\_\_  
Typed, Printed or Stamped Name of Notary

# PRE-CONSTRUCTION MEETING CHECKLIST

INSPECTOR'S NAME: Belle Glade Airport WUD #: 20-579 AREA: 14

NAME OF PROJECT: \_\_\_\_\_

NAME OF CONSULTING ENGINEER: Kimley Horn

ITEM #	DESCRIPTION	Date Accepted
1.	Approved Plans and PDF files of the approved design (24" x 36") (As-Built # _____)	<u>Required</u>
2.	WUD Wastewater/Fire line service initiation fees paid for projects that do not include water meters	<u>N/A</u>
3.	Copy of approved PBCHD and/or DEP Permits <u>WUD</u>	<u>Required</u>
4.	Approved Land Development Permit or letter from Developer acknowledging "Construction at his/her own risk"	<u>N/A</u>
5.	Approved FDOT/City/County Road Permit with copy of the MOT plan approved by the road owner (IE. H.O.A., Corporation, City, County)	<u>Required</u>
6.	One (1) copy of the cost estimate for water/wastewater/reclaim water (separate cost breakdown of each item type as project required)	<u>Required</u>
7.	Copy of state license of the Underground Utilities Contractor, Plumbing Contractor, or General Contractor (Note that a GC's license does not allow them to run utility lines from the main to the building) <u>GC + Plumber</u>	<u>Required</u>
8.	Copy of manufacturer acceptance of Corrosion Barrier Applicator	<u>N/A</u>
9.	Inspection fee equal to 5% of total cost estimate (\$750.00 minimum) (Include 10% Franchise Fee for Area 11; Add'l 10% for Loxahatchee Groves)	<u>Required</u>
10.	3 copies of FPL transformer layout and street/parking lot lighting plans	<u>N/A</u>
11.	3 copies of the PBCWUD Approved Materials List signed by the Engineer and Contractor	<u>Required</u>
12.	3 copies of shop drawings for aerial crossing piles, caps, and fan guards <u>along with Engineer signed &amp; sealed pile calculations per FDOT Standards</u>	<u>N/A</u>
13.	3 copies of shop drawings for all types of sanitary manholes. <u>Approval stamp &amp; signature of the Engineer &amp; Contractor on the pre-caster's forms</u>	<u>N/A</u>
14.	3 copies of shop drawings for air release vaults/manholes, sand/oil interceptors, oil/grease interceptors, and grease traps. <u>Approval stamp &amp; signature of the Engineer &amp; Contractor on the pre-caster's forms</u>	<u>N/A</u>
15.	5 copies of books for lift station pumps, control panel, and bypass pump/generator as applicable. 3 copies of shop drawings for wet well and valve vault. <u>Approval stamp &amp; signature of the Engineer &amp; Contractor on the pre-caster's forms.</u>	<u>N/A</u>
16.	5 copies of RTU control panel and specifications for reclaimed lake discharge and applicable direct connect installations	<u>N/A</u>
17.	Two (2) set of landscape plans for Engineering & Inspection files.	<u>N/A</u>
18.	Applicable Drainage District (IE. LWDD, etc.) Permit, as required.	<u>N/A</u>
19.	Pilot Bore Plan for Directional Drill Installations, with 5 years HDD Contractor references and Certification of Training Completion for field welding/fusion of HDD pipe	<u>N/A</u>
20.	Standard Development Agreement	<u>N/A</u>

NOTE: The required items listed above must be submitted & accepted prior to scheduling a pre-construction meeting. Underground Utility Contractor/Plumbing Contractor and General Contractor to be present at the pre-con meeting unless waived in advance by the PBCWUD

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT \_\_\_\_\_ AT (561) 493-6229

## **SECTION 6 - PROJECT COMPLETION REQUIREMENTS**

### **6.1 RECORD DRAWINGS**

All projects shall require the submittal of record drawings (A.K.A. As-Built drawings) prior to any water, wastewater and/or reclaimed water facilities being accepted by Palm Beach County Water Utilities Department (Department). The State Plane Coordinate System (x, y, and z) shall be used for all As-Built data locating any Department facility. In addition, the Department will only accept the addition of station and off-sets along with State Plane Coordinates on any installed Department facility when it is installed within road right-of-way as part of a roadway permit as required by the road right-of-way permitting Agency. State Plane Coordinates (x, y, and z) shall be shown on all pipes at 100' intervals, and all fittings, as-built elevations for pipe crossings, pipe lengths, and locations, as appropriate, for all facilities. As-Built drawings for potable water shall including water services and shall show sample points for bacteriological sampling. As-built data for water services shall include control valves and services taps on all water service installations no matter if both occur alongside the water main. As-built drawings for gravity sewers shall include pipe lengths, slopes, cleanouts, data for conflict clearances, manhole rims and invert elevations. If the gravity sewer system includes oil/grease interceptors and/or sand/oil interceptors the cleanouts located on each end of each interceptor shall be shown with as-built data, specifically the invert elevations. Utilities are to be shown at the actual location on the record drawing. For an on-site distribution plan, the design alignment is to be deleted, leaving only the as-built alignment on the plan. For any transmission main located within a right-of-way, the original design alignment may remain, appearing together with the as-built alignment. All as-built data shall be bolder than any design and background information on the record drawing. Additional enlarged details to scale may be required to clarify as-built data for hard to read areas. Separate water, wastewater and reclaimed water record drawings may be required at the Department's discretion so all as-built data will be clearly legible on any record drawing that is cluttered with combined as-built data. All Department water, wastewater and reclaimed water crossings shall be provided with as-built data at the crossing location. As-Built data shown in table format associated with crossings or for any other Department required data placed is not acceptable. Any such tables will be required to be removed prior to the final As-Built drawings being accepted by the Department.

When submitting record drawings, the initial submittal shall consist of three (3) surveyor signed & sealed copies of each water, wastewater and reclaimed water drawing as applicable for review. Then two (2) surveyor signed & sealed copies of each revised record drawing thereafter until the As-Built drawings have been accepted by the Department. No project cover sheets are to be part of any As-Built drawing submittal. Preliminary record drawings used for "Construction Water Only" release from the Health Department shall include at a minimum as-built data on all sample points, all potable water facilities, all potable water main crossings with other water, wastewater, reclaimed water, storm, and gas pipes along with all electrical and communication conduits, both new and/or existing pipes and conduits, prior to the Department approving a "Construction Water Only" request. When requesting partial "Construction Water Only" release, or partial final DEP/PBCHD Water and/or Wastewater Certification a set of record drawing prints being submitted for review shall be highlighted to reflect the portion of the project that is being requested to be released.

As-Built drawings shall address the following:

- (a) All As-Built drawings shall be computer generated. No hand written as-built data will be accepted.

- (b) The original WUD approved design plan view sheets and profile sheets shall be used for as-built presentation or an as-built survey is also acceptable provide all original design data is shown on the survey.
- (c) All As-Built submittals shall include all original project Department approved plan and profile view drawing notes, location map, etc., along with all as-built data being shown unless otherwise determined by the Department
- (d) Record drawing prints must be signed and sealed by a Professional Land Surveyor or the Engineer of Record provided the engineer witnessed the collection of as-built data. A "Third Party Disclaimer" will not be accepted (i.e. As-Built data provided by contractor). All as-built data shall be collected by the same party who is preparing the Record Drawings. Record Drawings signed and sealed by a Land Surveyor must comply with applicable Florida Statutes.
- (e) Each record drawing sheet shall contain surveyor notes and legend applicable to that drawing.
- (f) The as-built data on submitted drawings (line work, numerical data) must be clearly legible, accurate and comply with Department standards. An increase in font size and/or the use of a different font style may be required to improve legibility. Separate water, wastewater, and reclaimed water record drawings may be required for projects with a high density of data and/or poor legibility (i.e., multi-family complexes, commercial centers, etc.).
- (g) If As-Built drawings are for only potable water the drawings must state "Water Only", and if the As-Built drawings are for wastewater only the drawings must state "Sewer Only".
- (h) Add street names and addresses to each lot, building, and unit.
- (i) All record drawings that contain plan views shall indicate the recording information associated with project such as the plat, Plat Book/Page, along with any Palm Beach County Utility Easements (PBCUE) recorded by ORB/Page.
- (j) Complete title block with current file name (including f/k/a, a/k/a, plat name, etc.). Label drawings "Record Drawing" or "As-Built Drawing" and show appropriate entries in the revision block.
- (k) As-Built drawings with plan views must state the valve manufactures, the fire hydrant manufacturer and model, the corrosion barrier system and applicator.
- (l) Horizontal coordinates shall be rounded off to the nearest tenth of a foot. Elevation data shall be rounded off to the nearest hundredth of a foot (I.E. top of manholes, inverts, top of pipes, etc.). Elevation datum shall be listed on each plan view sheet. Slopes shall be rounded off to the nearest one-ten thousandth.
- (m) As-built data for pressure mains must include coordinates for valves, fittings, hydrants and top of pipe @ 100 foot intervals. As-built data must also include elevations for top of nut on valves, fittings, hydrant main nozzle and on top of pipe @ 100 foot intervals.
- (n) All new hydrants and main valves must be numbered on As-Built drawings.
- (o) As-built data for sewer laterals shall include coordinates for cleanouts (and invert elevations if proposed invert elevation data is shown on the design plan).
- (p) As-built data for water services shall include taps and meter control valve for meter sizes 2" or less (PVC and HDPE services). As-built data required on all fittings and valves associated with meter sizes 3" or larger.

- (q) As-built data for “wet tap” or “cut-in” connections into an existing pressure pipe system required on tapping sleeve or tee as applicable, new gate valve(s) associated with the connection and the distance to the nearest existing in-line valve(s).
- (r) All casings installed require as-built data on both ends to include both horizontal coordinates and elevation.
- (s) As-built data for oil/grease interceptors (OGI’s), grease traps and sand/oil interceptors (SOI’s) shall including interceptor type, manufacturer, model number, and capacity. The cleanouts located at each end of an interceptor or grease trap shall be shown with as-built data on the inverts.
- (t) Lift station as-built information is required to be reflected on the project’s “Lift Station Mechanical Standard Details, 1 of 2” sheet. As-built data must be shown on the “Wet Well”, Pump Data” and “RTU Record Data” charts as well as the site plan on that sheet.
- (u) If the lift station is providing power and communication to a reclaimed water lake discharge system the reclaimed lake discharge as-built information must also be shown on the “Lift Station Mechanical Standard Details, 1 of 2” sheet site plan.
- (v) As-Built drawings associated with phasing of project shall clearly state phase number to applicable sheets with the phase limits being clearly defined on all applicable drawings. If As-Built drawings are for only water the drawings must state “Water Only”, and if the As-Built drawings are for wastewater only the drawings must state “Sewer Only”. Gravity sewer must terminate at a manhole with a temporary plug being shown for future phase(s). Phased as-built drawings with lift stations must include in the first phase as-built data for the lift station and force main up to the point of connection to the “existing” wastewater system. Phased pressure potable water mains and wastewater force mains shall end at a restrained valve for future pressure main extension.

Once the Department accepts the record drawings a final record drawing package is required to be submitted for permanent Department records. The final record drawing package shall include the following:

- (a) Two (2) surveyor signed & sealed sets of prints (24” x 36”) and two (2) sets of unsigned prints.
- (b) Electronic record drawings file submitted on a CD, a flash drive, or another electronic format as determined by the Department. The electronic files must include the As-Built drawings (AutoCAD Release 2010 version or higher with x-references bounded to files). along with PDF files of the AutoCAD drawings saved to 24"x36" in size and an AutoCAD "Strip" file. The strip file only shows the property boundaries and the WUD facilities (IE. pipes, valves, etc.) with no text being shown. Note the layers cannot just be turned off but removed thus stripped.

## **6.2 RECORD DATA LIST AND REQUIRED TESTS**

All projects when applicable shall require the submittal of a “Manhole, Hydrant and Valve” data list using a spreadsheet format (EXCEL) as approved by the Department. The engineer of record shall submit a hard copy for review and acceptance. Once the data list has been accepted the engineer is required to submit a hard copy along with an electronic file copy.

Fire hydrant Fire Flow Tests are required for all new and relocated fire hydrants associated with a

project. The fire hydrant Fire Flow Tests are required to be completed by the PBC Fire Marshal Office or applicable Fire Rescue Department within an incorporated city, town or village within the Department's service area. The fire hydrant Fire Flow Tests shall not be conducted until after the potable water system has received DEP/PBCHD "Construction Water Only" Certification and has passed its required Department pressure test. The engineer is required to submit one (1) copy of each fire hydrant Fire Flow Test for the project prior to the Department approving a project's final DEP/PBCHD Water Certification.

When a project has new and/or renovated sanitary sewer concrete structures (i.e. manholes, lift station wet well or valve vault) the engineer is required to submit either a spark test or a thickness test for the applicable corrosion barrier coating applied to each concrete structure. The spark test and/or thickness tests must be submitted and accepted prior to Department approving a project's final DEP Wastewater Certification.

### **6.3 LEGAL DOCUMENTS**

All projects when completed require a Bill of Sale, Attachment to Bill of Sale and Owner's Affidavit forms to be submitted for Department review and acceptance. The Bill of Sale form shall be signed by the project's developer/property owner as applicable and shall be witnessed by two (2) separate individuals and notarized. The Attachment to Bill of Sale form shall be completed and signed by both the project's developer/property owner as applicable along with either the Underground Contractor or General Contractor as applicable. The costs reflected on the Attachment to Bill of Sale form shall only include the water, wastewater and reclaimed water facilities (assets) being turned over to the Department. If a project includes a new Department lift station the lift station number shall be listed on the form along with the emergency generator or emergency pumping unit serial number(s) when applicable. When the Bill of Sale and Attachment to Bill of Sale are submitted and are deemed acceptable those forms will not become officially accepted by the Department until the date the project's final DEP/PBCHD Water Certification and/or DEP Wastewater Certification form(s) have been approved by the Department. If no final DEP/PBCHD Certification is required on the project, then the Bill of Sale and Attachment to Bill of Sale will become officially accepted by the Department when all final required project closeout documents have been submitted and accepted by the Department. An Owner's Affidavit is required to be completed and signed by the project's developer/property owner as applicable and shall be witnessed by two (2) separate individuals and notarized.

### **6.4 UTILITY EASEMENT**

When a Palm Beach County Utility Easement (PBCUE) is required over installed potable water, wastewater (both gravity sewer and force main) and reclaimed water facilities to be owned, operated and maintained by the Department. Generally a minimum twenty (20) foot wide PBCUE is required centered over any Department pipe with a minimum ten (10) foot wide PBCUE required over potable water, wastewater and reclaimed water services along with any Department owned power and communication lines. A PBCUE shall extend ten (10) feet minimum past any Department owned pipes and manholes with five (5) feet minimum required past any services and fire hydrants. The final width and length of the required PBCUE shall be determined by the Department to ensure that no existing and/or new structures, trees, shrubs or other similar items are placed near any Department owned and maintained pipe and/or facility.

When a Department owned wastewater pump station and related access drives do not already have

a PBCUE specifically dedicated through the platting process an exclusive PBCUE will be required to be granted. The final size, location and configuration of the pump station site PBCUE shall be determined by the Department.

An exclusive PBCUE is required for all public water supply well sites. The well site PBCUE shall be a minimum of 60' x 40' for the well and well head piping. Additional access easements and/or utility easements for well construction, maintenance and off-site raw water main piping and other auxiliary utilities may be required at the discretion of the Department. The final size, location and configuration of the well site PBCUE shall be determined by the Department.

All PBCUE legal descriptions and sketches are required to be prepared, signed and sealed by a licensed surveyor. Once the legal description & sketch is prepared the engineer of record is required to submit two (2) original surveyor signed & sealed copies for the Department's review and acceptance. Once a PBCUE legal description & sketch has been accepted, the Department will approve one (1) original and return it to the engineer of record for recording purposes. A current Department authorized PBCUE cover page shall accompany the approved legal description & sketch when recorded. The cover page is required to be signed by the property owner and shall be witnessed by two (2) separate individuals and notarized for the recorded PBCUE to be accepted by the Department. If the property on which the PBCUE is being granted has a mortgage, then a current Department authorized "Consent and Joinder of Mortgagee for Utility Easement" form must be executed by the mortgage holder and shall be recorded with the PBCUE. The "Consent and Joinder of Mortgagee for Utility Easement" form shall be attached to the PBCUE and placed behind the PBCUE cover page when being recorded. After the PBCUE has been recorded the engineer of record is required to submit a certified copy to the Department for their use.

A Title Policy for the benefit of the Department is required for the recorded PBCUE and the policy amount shall be \$50.00 per lineal foot of recorded PBCUE measured along its centerline. If a PBCUE is required for a Department owned wastewater pump station site and related access drives the Title Policy for the lift station PBCUE area alone shall be a set amount of \$150,000.00. When a PBCUE area is 1,000 square feet or less an Opinion of Title may be acceptable in the place of a Title Policy at the Department's discretion. When a Utility Easement for Department facilities is granted by plat a copy of the recorded plat is required to be submitted for Department review and for verification that all Department facilities are within the platted Utility Easement(s)

## **6.5 INDEMNITY AGREEMENT**

An Indemnity Agreement is required when there is any encroachment into a Palm Beach County Utility Easement (PBCUE) including but not limited to paver brick, actual brick and/or stamped concrete, sidewalks and/or driveways along with fences and/or walls. The Indemnity Agreement must be signed by the property owner and shall be witnessed by two (2) separate individuals and notarized. A sketch to an engineer scale detailing the encroachment is required to be prepared by a licensed surveyor with the sketch being signed and sealed by the surveyor. The sketch shall detail the encroachment area within the PBCUE with the PBCUE being clearly shown. The sketch shall be labeled "Exhibit B" and be attached to the Indemnity Agreement when submitted to the Department for processing. If the property on which the Indemnity Agreement is being granted has a mortgage, then a current Department authorized "Consent and Joinder of Mortgagee for Indemnity Agreement" form must be executed by the mortgage holder and be submitted with the Indemnity Agreement and sketch for the Department to process the Agreement.

## **6.6 DEP/PBCHD CERTIFICATION**

When applicable projects shall require DEP/PBCHD Certification for potable water systems and DEP Certification for wastewater systems by the Health Department. When the project has a potable water permit DEP/PBCHD "Construction Water Only" Certification is required prior to any pressure testing of the new system and fire hydrant fire flow tests being completed. The Department will approve the DEP/PBCHD "Construction Water Only" Certification form(s) once the project has received passing two (2) day bacteriological tests along with preliminary As-Built drawings being submitted, reviewed and accepted for construction water only purposes as outlined in Subsection 6.1 - Record Drawings. Only after the project has received "Construction Water Only" certification can the contractor start any type of pressure testing either their own or by the Department. The project can only receive final DEP/PBCHD Water Certification once the potable water system has passed its required Department pressure test along with all required fire hydrant Fire Flow Tests and any Utility Easements required over Department facilities being recorded by plat and/or by PBC Official Record Book (ORB) and Page. The project can only receive final DEP Wastewater Certification once the wastewater system has passed its required Department testing including but not limited to gravity main lamping, force main pressure testing, lift station start-up and all applicable spark tests and/or thickness tests for all wastewater structures with an approved corrosion barrier system applied being submitted and accepted by the Department. If the project required an Utility Permit to cross a road right-of-way or a Right-of-Way Permit to cross a canal right-of-way the Department requires written confirmation from the permitting Agency that all work has been completed to their satisfaction prior to the Department approving final PBCHD/DEP Water and/or Wastewater Certification forms.

## **6.7 MISCELLANEOUS DOCUMENTS**

When a project includes a Department lift station the engineer of record is required to submit to the Department a copy of any form of FPL documentation (i.e. FPL bill or FPL e-mail creating an electric account) showing that an account has been established for the lift station electric service. Once FPL documentation is received the Department will proceed in transferring the electric service into the County's name. The FPL documentation must include the lift station address and FPL account number. The electric service shall not be transferred into the County's name until the project has been completed and has received final DEP Wastewater Certification from the Health Department.