

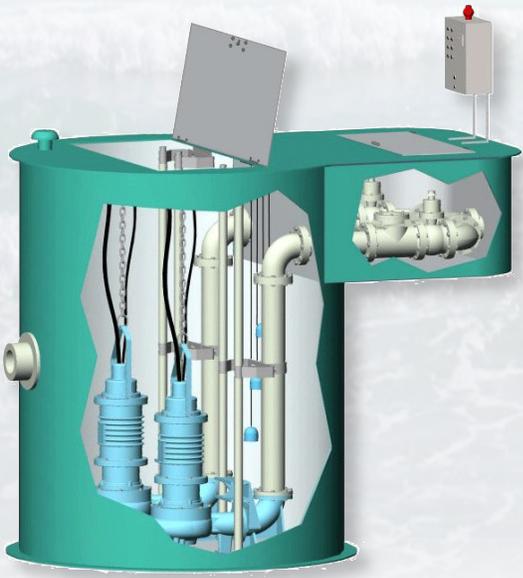


City of Pompano Beach

# Pump Station #81 Rehabilitation

Technical Specifications  
May 2012

## ENGINEERING



## EXCELLENCE

Prepared By:



815 NW 57th Avenue  
Suite 402  
Miami, FL 33126

Gregory A, Mendez, P.E.  
State of Florida  
P.E. 64718

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## SECTION 02 41 19

### SELECTIVE STRUCTURE DEMOLITION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. The Contractor shall furnish all the labor, equipment, tools and perform all the selective demolition required in this section. This Section includes
  - 1. Removal of designated hatches and fixtures.
  - 2. Removal of all pumps, rails, and miscellaneous hardware from the pump station wet well and valve vault.
  - 3. Removal of piping, fittings and valves from the wet well and valve vault.
  - 4. Removal of the existing control panel, concrete base, antenna and antenna foundation.
  - 5. Protecting items designated to remain.
  - 6. Removing demolished materials.
- B. Related Sections:
  - 1. Section 31 10 00 – Site Clearing.

##### 1.2 QUALITY ASSURANCE

- A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection.
- B. Should hazardous or contaminated materials be discovered, inform the Engineer and the City of Pompano Beach immediately and conform to all applicable code for procedures.
- C. Obtain required permits from authorities having jurisdiction.
- D. Perform Work in accordance with City of Pompano Beach standards and Broward County Water and Wastewater Services Standards.
- E. Maintain one copy of the drawings and specifications on site at all time.

##### 1.3 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent building areas.
- B. Cease operations immediately if structure appears to be in danger and notify Engineer and the City of Pompano Beach. Do not resume operations until directed.

#### PART 2 PRODUCTS

Not Used.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Notify affected utility companies before starting work and comply with their requirements.
- B. Mark location and termination of utilities.
- C. Erect, and maintain temporary barriers, erosion control and security devices, including warning signs and lights, and similar measures, for protection of the public and existing improvements indicated to remain.

### 3.2 DEMOLITION

- A. Conduct demolition to minimize interference with adjacent building areas.
- B. Maintain protected egress from and access to adjacent existing buildings at all times.
- C. Do not close or obstruct roadways without permits.
- D. Disconnect and remove designated utilities within demolition areas.
- E. Securely cover all openings in the wet well and valve vault at nights and weekends.

END OF SECTION

## SECTION 31 10 00

### SITE CLEARING

#### PART 1 GENERAL

##### 1.1 SUMMARY

The following tasks are included in preparation for site work:

1. Clearing, grubbing and removing surface debris.
2. Protecting existing trees and vegetation to remain
3. Stripping and stockpiling topsoil.
4. Removing above- and below-grade site improvements.
5. Removing designated paving, concrete slab, water meter, bollard, and backflow prevention.
6. Removing existing control panel and antenna.
7. Protecting existing control trees.

B. Related Sections:

1. Section 33 32 16 package utility wastewater pumping station.

##### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Site Clearing:

1. Basis of Payment: Contract lump sum price shall include clearing site, loading and removing waste materials from site.

##### 1.3 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Prepare 'As-built' record drawings, identifying and accurately locating underground utilities, capped utilities and other surface structural, electrical and mechanical conditions. All as-built drawings must be provided as per City of Pompano Beach Standards and all applicable jurisdiction having authorities.

##### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Pompano Beach and Broward County Water & Wastewater Services standards.

- B. Conduct a pre-construction conference on-site prior to start of work.
- C. Maintain one copy of construction plans and specifications on site at all time

### 1.5 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, street, walks and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks or other adjacent occupied or used facilities without permission from City of Pompano Beach and all authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Improvements on Adjoining Property: working on private is strictly prohibited unless authorize by the City of Pompano Beach.
  - 1. Do not proceed with work on adjoining property until directed by Engineer or City of Pompano Beach.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on City of Pompano Beach's premises where indicated.
- D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- E. Do not commerce site clearing operations until temporary erosion and sedimentation control measures are in place.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify existing plant life designated to remain is tagged or identified. Waste material shall be removed from the project site and dispose as per City of Pompano Beach and Broward County Water & Wastewater Services (BCWWS).

### 3.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than two working days (48 hours) before digging.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.

### 3.3 PROTECTION

- A. Locate, identify, and protect utilities indicated to remain, from damage.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping.
- C. Protect bench marks, survey control points, and existing structures from damage or displacement.

### 3.4 CLEARING

- A. Clear areas required for access to site and execution of Work to minimum depth of six inches.

### 3.5 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Remove paving, concrete slab, water main, water meter, bollard, backflow preventer, control panel, antenna as dictated on the drawings.
- C. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- D. Do not burn or bury materials on site. Leave site in clean condition.
- E. All waste material removed from the project site shall be legally disposed of off City Pompano Beach Property.

### 3.6 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regarded.
- B. Remove excess topsoil not intended for reuse, from site and dispose of according to City of Pompano Beach & Broward County Water & Wastewater Services Standards

### 3.7 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of all authorities having jurisdiction.
- B. Inspect, repair and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and stabilized areas disturbed during removal.

END OF SECTION

## SECTION 31 23 17

### TRENCHING

#### PART 1 GENERAL

##### 1.1 SUMMARY

All excavations shall be in accordance with the requirements of the Florida Building Code, the Florida Trench Safety Act, AHSA, and all applicable agencies.

- A. Task in this section includes:
  - 1. Compacted fill from top of utility bedding to subgrade elevations.
  - 2. Backfilling and compaction.
  
- B. Related Sections:
  - 1. Section 31 05 13 - Soils for Earthwork: Soils for fill.
  - 2. Section 31 05 16 - Aggregates for Earthwork: Aggregates for fill.
  - 3. Section 31 22 13 - Rough Grading: Topsoil and subsoil removal from site surface.
  - 4. Section 31 23 23 - Fill: General Backfilling.
  - 5. Section 32 91 19 - Landscape Grading: Filling of topsoil over backfilled trenches to finish grade elevation.
  - 6. Section 33 31 00 - Sanitary Utility Sewerage Piping.

##### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Trenching:
  - 1. Basis of Payment: Includes excavating to required elevations, protecting excavation, and removing excavated materials from site. Over Excavating: Payment is not made for over excavated work nor for replacement materials.
  
- B. Subsoil Fill:
  - 1. Basis of Payment: Includes furnishing fill material, stockpiling, placing where required, and compacting.
  
- C. Structural Fill:
  - 1. Basis of Payment: Includes furnishing fill material, stockpiling, shaping substrate surface placing where required.
  
- D. Concrete Fill:
  - 1. Basis of Payment: Includes furnishing materials, forming, mixing and placing where required, and curing.

##### 1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and an 18-in. Drop.
  - 2. AASHTO T 238- Standard Test Methods for Density of Soil and Soil- Aggregation in Place by Nuclear Method (Shallow Depth).

#### 1.4 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, cable, manholes and appurtenances.

#### 1.5 SUBMITTALS

- A. Shall be done as per City of Pompano Beach and Broward County Water & Wastewater Services and all other applicable jurisdiction having authority.

#### 1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Pompano Beach and Broward County Water & Wastewater Services and all other applicable jurisdiction having authority.
- B. Maintain one copy of construction drawings and specifications on site at all time.

#### 1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication and construction.

#### 1.8 COORDINATION

- A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.
- B. Contractor to Contact Sunshine prior to construction and installation of Force mains.

### PART 2 PRODUCTS

#### 2.1 FILL MATERIALS

- A. Subsoil Fill: Shall be in accordance with City of Pompano Beach and Broward County Water & Wastewater Services and all other applicable jurisdictions having authority.
- B. Structural Fill: Shall be in accordance with City of Pompano Beach and Broward County Water & Wastewater Services and all other applicable jurisdictions having authority.
- C. Granular Fill: Shall be in accordance with City of Pompano Beach and Broward County Water & Wastewater Services and all other applicable jurisdictions having authority.

- D. Concrete: Shall be in accordance with City of Pompano Beach and Broward County Water & Wastewater Services and all other applicable jurisdiction having authority.

## 2.2 BACKFILL MATERIAL

- A. Except where a 1:10 cement/sand or flowable fill concrete mix is required, granular soil backfill materials shall be utilized. Suitable backfill material shall be cleaned, shall not be expansive nor have high organic content, shall be free of clay, marl, unstable materials, debris, lumps and clods, and shall meet the following requirements:
  - 1. Maximum Liquid Limit shall not exceed 12 as determined by ASTM D 423.
  - 2. Maximum Plasticity Index shall not exceed 35 as determined by ASTM D 424.
  - 3. Not more than 10 percent of weight shall be finer than 74 micron (No. 200) U.S Standard Sieve.
- B. Backfill material containing limerock shall have sufficient sand to fill the voids in the limerock. No stones or rocks larger than 6-inches in diameter will be permitted in any backfill. Backfill material placed to a point at least one foot (1ft.) above pipe and appurtenance shall be select backfill material not exceeding 2-inches in diameter. In any case, above this point, but up to the upper 6-inches of the trench, backfill shall be of material not exceeding 6-inches in diameter.
- C. Debris, broken paving or broken concrete shall not be used.
- D. Material for backfill may be material resulting from excavation, only if it meets the above mentioned requirements, or if suitable in the opinion of the Department. If sufficient suitable backfill material, including select backfill material, is not available from the site, additional material shall be furnished.

## 2.3 SELECT BACKFILL MATERIAL

Select backfill material specified in these specifications or required by the Plans shall meet all the general requirements for backfill material set forth above, and in addition, shall be free of any rocks or stones larger than 2 inches in diameter. Select backfill for cooper tubing shall be limerock screenings or sand. Select backfill material may be resulting from excavation, if suitable in the opinion of City of Pompano Beach, carefully selected to comply with these requirements.

## 2.4 BEDDING MATERIAL

Pipe bedding material shall consist of one of the following types of material, and accordance with the construction drawings.

- A. Bedding may be select backfill material, as specified above and as per City of Pompano Beach Standards.
- B. Crushed stone (or drainfield limerock) shall be used for bedding of piping (except for cooper pipe) and/or manholes as shown on the Standard Details. Crushed stone be free consist of hard, durable, sub-angular particles or proper size and gradation, and shall be free from organic material, wood, trash, sand, loam, clay, excess fines and other deleterious materials. The stone

shall conform to the requirements of ASTM C 33, Size No. 57 (3/4-inch rock) and be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1 ½- inch	100
1- Inch	95- 100
½-inch	25 to 60
No. 4	0 to 10
No. 8	0 to 5

- C. Limerock screenings, sand or other fine material shall not be used for bedding.
- D. All pipes bedding material shall be new, unless otherwise approve by the City Engineer. Existing pipe bedding material may not be used.

### PART 3 EXECUTION

#### 3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
  - 1. Engineer and City of Pompano Beach reserve the right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

#### 3.2 PREPARATION

- A. Call Sunshine State one call of Florida, Inc at 1-800-432-4770 not less than 48 hours before digging.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Clear necessary area for the proper installation of all piping and appurtenance as shown on the drawings.
- D. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.
- E. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- F. Maintain and protect above and below grade utilities indicated to remain.

- G. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

### 3.3 EXCAVATION

- A. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions and depth shown on the Drawings. All excavations shall be made by open cut.
- B. When the walls of the excavations are to be kept vertical and in order to protect the safety of workmen, the general public, this or other work or structures, or excavation walls, or pipe installation including materials encountered in the excavation which have a tendency to slough or flow into the excavation, undermine the banks, weaken the overlying strata, or are otherwise rendered unstable by the excavation operation shall be retained by steel sheeting, stabilization, grouting or approval methods. Said methods shall comply with the Trench Safety Act (TSA). Sheeting and shoring or other approved method shall be designed by a Professional Engineer licensed to practice in the State of Florida.
- C. In areas where trench widths are not limited by right-of-way or easement widths, property line restrictions, existing adjacent improvements including pavements, structures and other utilities, and maintenance of traffic, the trench sides may be sloped to a suitable angle of repose of the excavated material, but only from a point one foot above the crown of the pipe.
- D. A substantially and safety constructed moveable shield or box, as approved by the Engineer of Record, may be used in place of sheeting, except where specifically called for on the Plans to install sheeting. Where a moveable shield or trench box is used in place of sheeting and shoring, the trench shall be opened immediately ahead of the shield as pipe laying proceeds inside the shield.
- E. Ladders or steps shall be provided for and used by workmen to enter and leave trenches.
- F. Materials removed from the trenches shall be shored and deposited in such a manner that they will not interfere unduly with traffic on public streets and sidewalks. In congested areas, such materials, cannot be stored adjacent to the trench nor used immediately as backfill, shall be removed to condition, it shall be removed immediately to a storage area.
- G. Materials suitable for use as backfill be hauled to and used in areas where not enough suitable material is available from the excavation. Material unsuitable for use in backfill shall be removed promptly and disposed of by the Contractor.
- H. Excavation for Pipes and Piping Appurtenances:
  - 1. Clear, as stated above, all existing items or structures in the way of proposed pipelined or structures and excavation as necessary to the lines and grades shown on the Drawings.
  - 2. Where pavements or sidewalks are cut they shall be cut by means of a mechanical pavement saw to form true and straight edges which shall in general be either parallel or at right angles with the concrete of the pipe.

3. In order to protect himself from being held liable for any existing damaged pavement, including detour routes, the Contractor is advised to notify in writing the authority having jurisdiction over the street where such defective pavement exists prior to processing with any work in the vicinity. A copy of all such notices shall be forwarded to the Engineer.
4. Excavation pipe trenches to a minimum of 6-inches below the outside bottom of the proposed pipe barrel to provide for the installation of the bedding material.
5. if, in the opinion of the Engineer the soil that dept is unsatisfactory as foundation material because it contains unsuitable marl, muck, organic matter, or other unsuitable material, the excavation shall be continued 2 feet deeper, except if a suitable foundation material is exposed at a lesser depth, further excavation will not be required.
6. If the soil is still unsuitable after the additional excavation as prescribed above, the trench bottom shall be excavated further in one foot increments in accordance with "Trench Overcut", below.
7. Sheeting and shoring shall be installed where necessary to control trench width, protect the workmen and the general public, and prevent damage to this or adjacent work, or structures.
8. If interlocking sheeting is used, the Engineer may permit its complete removal in lieu of cut-off, providing removal can be accomplished without disturbing the bedding, pipe or alignment of the pipe. Any damage to the pipe bedding, pipe or alignment of the constructed utility caused by removal of sheeting shall be cause for rejection of the affected portion of the work. Not more than 100-feet of trench shall be opened ahead of pipe laying operations at one time unless a greater length of open trench is approved by the Engineer.
9. Trench widths, when measured at a point 12 inches above the top of the pipe, shall provide a 12-inch maximum clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheeting if used. Minimum trench width shall provide at least 6-inch clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheeting if used.
10. Excavation for appurtenances, such as manholes and valves, shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation or sheeting, if used, of not less than 12-inches. Manhole excavations shall be carried to sufficient depth to permit their construction on the undisturbed bottom of the excavation.
11. Selected backfill shall then be placed in and compacted in 6-inch layers up to the level of the pipe bedding material.
12. When the pipe to be installed in a trench requires the pipe installers to work under the pipe, a 12" minimum separation shall be maintained
13. The ends of existing mains shall be temporarily capped or plugged to keep them clean and the ends of all mains shall be temporarily anchored to keep the joints from blowing apart from internal pressure until the new mains can be reconnected to them.

14. In addition to specific construction methods specific construction methods specified, the general requirements in subsequent subsections, below, shall apply to this project.

### 3.4 TRENCH STABILIZATION

Trench bottoms which are rendered soft or unstable as result of construction methods, such as improper or inadequate sheeting, dewatering or other causes, shall be stabilized. In no event shall pipe be installed when such conditions exist. The Contractor shall correct such conditions so as to provide proper bedding or foundations for the proposed installation.

### 3.5 TRENCH OVERCUT

- A. If, after excavating the trench to a depth of 2 feet 6 inches below the outside bottom elevation of the proposed pipe barrel, and the soil at that depth is still unsatisfactory as foundation material because it contains marl, muck, organic matter, or other unsuitable material, the pipe trench shall be excavated further in one-foot depth increments until a suitable foundation material is found. As a point of reference, it has been the Engineer's experience that, typically, trench overcut does not extend to depths more than 6 feet. However, the Engineer reserves the right to require trench overcut to depths up to 6 feet, i.e., to a point 8.5 feet below the bottom of the pipe.
- B. Select backfill, as defined above, shall then be compacted in 6-inch layers up to the bottom of the proposed 6 inch of pipe bedding.

### 3.6 REMOVAL OF WATER

- A. It is a basic requirement of these Specifications that excavation shall be free from water before pipe or structures are installed. However, it is realized that in certain sections of the work this cannot be accomplished economically and the Contractor may request permission to use "Alternate Method of Construction" defined below.
- B. The Contractor shall provide all necessary pumps, underdrains, well point systems and other means for removing water from trenches and other parts of the work including structures. The Contractor shall continue dewatering operations until the backfill has progressed to a sufficient height over the pipe to prevent flotation or movement of the pipe in the trench, do that the backfill is above the natural water level.
- C. The Contractor shall be required to obtain all necessary permits from all agencies having Jurisdiction, approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-away or into any existing drainage structure or facility.
- D. Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public private property, to the work completed or in progress, to the surface of the streets, or to cause interference with the use of the same by public. Submit the proposed method of handling and disposal of trench waster for approval before starting the excavation.

- E. The Contractor is cautioned that the governing body having jurisdiction over the work location may have regulatory rules and ordinances prohibiting, or limiting, the discharge of water from any excavation into sanitary and storm sewer systems, or to canals and drainage ditches. Obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way, or into any existing drainage structure or facility.
- F. Pumps and engines for dewatering systems shall be operated with mufflers and a minimum noise level suitable to a residential area. The Contractor shall be responsible for nuisance created due to the disposal of the water from hid discharge system.

### 3.7 INSTALLATION OF BACKFILL

- A. Backfilling of pipe trenches will not be allowed until the work has been approved by the Engineer, pressure tested if required, and the Engineer indicates that backfilling may proceed. Any work which is covered or concealed without the knowledge and consent of the Engineer shall be uncovered or exposed for inspection. Partial backfill may be made to help restrain the pipe during pressure testing, if previously authorized by the Engineer.
- B. The Contractor shall backfill all trenches and other excavations made in the process of installing the pipes. He shall maintain the surface of the backfill free from major irregularities and potholes.
- C. The Contractor shall exercise proper care to insure that no pipe will be broken or displaced through the use of the type of mechanical compacting equipment he selects. Water shall be added as required to obtain optimum moisture to facilitate compaction, but ponding or inundation of backfill will not be permitted. These ponding limitations shall not prohibit backfill in a wet trench up to the level of the natural water table if the "Alternate Method of Construction" is utilized.
- D. Backfill shall in general be kept up with the rate of pipe laying. The backfill up to the springline of the pipe shall be placed as soon as practical after the laying of the pipe. On parts of the line where ground water level may be high enough to float the pipe, the placing of the backfill and moving from the line and grade shown on the Drawings.
- E. In the event that sufficient suitable material is not available at any point to properly backfill the trench, the Contractor shall transport suitable material from points of the line where such material is available or shall otherwise furnish suitable material.
- F. Suitable material in excess of all backfill requirements and all unsuitable material shall be removed from the work and disposed of by the Contractor.
- G. Within paved areas of trench excavation, the base and surfacing shall be reconstructed as per City of Pompano Beach Standards.
- H. Where cuts have been made through unpaved, stabilized rock roadways, driveways and parkways, surface restoration shall consist of 3 inches of compacted limerock overlaid by 3 inches of gravel or graded and washed rock with a maximum diameter of ½ -inch, except as otherwise directed by the Engineer. The rock shall be installed over the entire width of the disturbed area and shall closely match the existing rock at each location. Several grades of rock

may be required to attain this end, but it is not anticipated that more than one grade will have to be used at any one location.

- I. Backfill for Structures shall then be brought to the structure bottom elevation by placing and compacting 6-inch layers of Oolitic limerock (or material previously defined) to 95 percent of maximum density as determined by AASTHO T-180. Structural fill shall be supplied by the suitable in the opinion of the Engineer. Backfill around new structures up to the pavement base or surface of the ground shall be material not exceeding 6-inches in diameter, and shall be compacted in layers not exceeding 9 inches. Each layer shall be compacted with a powered hand tamper, or other approval method to at least 98% of maximum density as determined by AASHTO-180
- J. Backfill for precast manholes shall be defined limerock or specified pipe bedding material to a level to receive the manhole at the proper elevation.

### 3.8 INSTALLATION OF PIPE BEDDING- FORCE MAIN

- A. As described above, all pipe trenches shall be excavated to level 6-inches below the outside bottom of the proposed pipe barrel. The resulting excavation shall be backfill with approved pipe bedding material, up to the outside bottom of the proposed pipe barrel. This material shall be tamped and compacted to provide a proper bedding for the pipe and shall then be shaped to receive the pipe, including recesses for the pipe bells and couplings. Placing and compacting bedding up to the level of the lower one-third of the pipe barrel shall immediately follow the installation of the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.
- B. Select Backfill material may be utilized where the excavated trench bottom is above water.
- C. Any excavation below the levels required for installation of the pipe bedding shall be backfilled with approved bedding material, tamped, compacted and shaped to provide proper support for the proposed pipe.

### 3.9 COMPACTION AND DENSITIES

- A. Methods of control and testing of backfill construction to be employed in this work are:
  - 1. Maximum density of the material in trenches shall be as per City of Pompano Beach Standards
  - 2. Filed density of the backfill material in place shall be as per City of Pompano Beach Standards
- B. Trench backfill which does not comply with the specified densities, as indicated by such tests, as per City of Pompano Beach Standards shall be reworked and recompacted until the required compensation is secured.

### 3.10 ALTERNATE METHOD OF CONSTRUCTION

#### A. General:

1. A combination of conditions in the substrata, water table, or method of disposal may be encountered during the course of the work which make dewatering impossible, or only possible through the use of unusual methods, the cost of which is excessive. When such conditions are encountered, but after all reasonable means to dewater the excavation have been employed without success, the Contractor, with the concurrence of the Engineer may elect to employ the following alternate method of construction. The concurrence of the Engineer shall be obtained and the Contractor shall limit the use of the alternate method of construction to such specific portions of the work as determined applicable.
2. The requirements set forth in other sections of these Specifications shall establish the required standards of construction quality for this work. Use of the alternate method of construction described hereinafter shall in no way be construed as relieving the Contractor of his basic responsibility for satisfactory completion of the work.
3. Subject to all the requirements stated hereinabove, including approval by the Engineer, construction will be permitted in accordance with the following specifications.

B. Removal of Water: The installation of pipe, manholes and appurtenances under water will be permitted and the dry-trench requirements of "Removal of Water" will be waived.

C. Excavation: Excavation shall be performed in accordance with normal applicable excavation specifications and as per City of Pompano Beach Standards.

#### D. Pipe Bedding for Ductile Iron

1. Pipe bedding shall be placed from 6-inches below the outside bottom of the proposed pipe barrel up to the level of the springline of the pipe barrel of gravity sewers and to the level of the lower one-third of the pipe barrel for force mains or water mains. The bedding materials shall be washrock, drainfield limerock or approved material. Limerock screenings, sand or other fine organic material shall not be used.
2. The bedding material used shall be tampered and graded to provide a proper bedding for the pipe and shall then be shaped to receive the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

#### E. Backfill:

1. After the pipe is installed, backfill shall proceed in accordance with the provisions of "Installation of Backfill", except that select backfill material or pipe bedding material shall be used to backfill around the pipe and to a level one foot above the outside top (crown) of the pipe. Under no circumstances shall material other than select backfill or specified pipe bedding material be considered satisfactory for this purpose.

2. If the Alternate Method of Construction is used, all backfill material, shall be carefully lifted into the trench and released to fall freely therein when the bucket or container is near or at a moderate height above water level. Height of release shall be to the satisfaction of the Engineer. Below the existing water level, and to a point not more than 18- inches above the water level, the backfill material shall be carefully placed in uniform layers, of equal depth on each side of the pipe. From a point not more than 18-inches above the water level, and below the pavement base or the surface of the ground if out of paving, backfill material shall be placed compacted for normal backfilling as provided in “Installation of Backfill”, “Compaction and Densities” and as per City of Pompano Beach Standards

### 3.11 RESTORATION OF EXISTING SURFACES

Paved and grassed disturbed by the operations required under this Section shall be restored as indicated on the approved Plans and/or specified herein and as per City of Pompano Beach Standards.

END OF SECTION

## SECTION 33 32 16

### PACKAGED UTILITY WASTEWATER PUMPING STATIONS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. The work in this section consist of the rehabilitation of the pump station and includes but not limited to:
1. Removal and disposal of the existing pumps, piping, rails, hatches and other hardware from the wet well and valve vault.
  2. Pressure clean the well and valve vault and repair concrete as required.
  3. Coat the wet well and valve vault.
  4. Install new pumps and control panel provided by the City of Pompano Beach.
  5. Furnish and install all piping, valves, rails, hatches, wiring and all other hardware required for a completed pump station as indicated on the drawings.

##### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Payment shall be on a lump sum basis as defined in the project contract.

##### 1.3 REFERENCES

- A.
1. Florida Building Code
  2. ACI 318, Building Code Requirements for Reinforced Concrete.
- B. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- C. ASTM International:
1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
  2. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  4. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  5. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
  6. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

7. ASTM D2467 - Standard Specification for Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.

D. American water Works Association.

1. ANSI/AWWA C151/ A21.51-02 "Ductile Iron Pipe, Centrifugally Cast, for Water".

#### 1.4 PERFORMANCE REQUIREMENTS

A. Basin Cover: Basin cover shall be suitable for H-20 loading.

B. Operation:

1. Provide, install and adjust level transmitter for 'lead pump on', 'lag pump on' and 'all pumps off' in the wet well. Start pump automatically when "lead on" level is attained. Stop pump automatically when "all pump off" level is attained. Signal alarm condition automatically when "high level" float is activated. Set elevations in accordance with Drawings.

#### 1.5 SUBMITTALS

A. Product Data: Submit for each component in the pumping station.

1. Include catalog data for hinged door, slide rail assembly, access frame data, discharge piping, valves, junction box, level controls, and control panel.
2. Include control panel data and panel wiring schematic.

B. Test Reports:

1. Submit written report showing factory pump inspections and tests have been successfully performed.

C. Manufacturer's Installation Instructions: Submit manufacturer's published installation instructions

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

#### 1.6 CLOSEOUT SUBMITTALS

A. Record As- built drawing showing actual locations of the pumping stations including basins, control panel, antenna, piping, valves, water meter, backflow preventer, etc.

B. Submit executed certification of pumping stations after performance testing.

C. Provide Operations and Maintenance Manual containing operating and maintenance requirements for pumping station and schedule of recommended maintenance.

#### 1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Pompano Beach and Broward County Water & Wastewater Services standards.
- B. Maintain one copy of the specifications and drawings document on site at all time.

## 1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

## 1.9 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week at City of Pompano Beach Engineer's office prior to commencing work of this section.

## 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Pick up pump, control panel and other items being provided by the City of Pompano Beach and store in a secure area.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation is complete.
- C. Protect piping from entry of foreign materials and water by temporary covers, completing sections of work, and isolating parts of completed system.
- D. Accept system components on site in manufacturer's original containers or configuration. Inspect for damage.
- E. Store sensitive materials for field assembly in dry area in original shipping containers.

## PART 2 PRODUCTS

### 2.1 PRODUCT

- A. Furnish materials in accordance with City of Pompano Beach standards.
- B. Cover: Wet well and valve vault hatches shall be manufactured by U.S Foundry or approved equal. Hatches shall be THD or THS Aluminum models suitable for H-20 loading with all stainless steel hardware. Hatches to be equipped with automatic hold open arms, compression springs, water tight slam locks, recessed pad lock, stainless steel, safety chairs and hinges to be attached using tamper proof carriage bolts with welded nuts. Bituminous coating shall be provided on surfaces in contact with concrete.

- C. Rail System: Slide rail assemblies consisting of 316 stainless steel upper and lower rail brackets and pump guide brackets and shall be manufactured by Flygt. The rail system shall be compatible with the Flygt pumps being provided by the City.
- D. Float Pole: ASTM D1785, Schedule 40 PVC, 1/2 inch (13 mm).
- E. LEVEL: Transmitter shall be a (Birdeage) submersible level Transmitter model number BC 001 as manufactured by Blue Ribbon Corp. of Grand Island New York. The transmitter shall be installed per manufacturer's recommendations.
- F. Level Controls: Mechanical float type or mercury type pilot duty liquid level controls with AWG 18-2 SJOW-A cable in polypropylene for mounting to PVC support pole.
- G. Cleaning System: Wastewater conditioning and cleaning system shall be system number EP-1300 complete with all required accessories as manufactured by ANUE WATER TECHNOLOGIES of Carlsbad California.
- H. Pipe: All pipes shall be Ductile Iron conforming to ANSI/ AWWA C151/ A21.51-02 class 350. Lining and coating shall conform to BCWWS STANDARDS. Pipe joints and fittings shall conform to BCWWS standards; push-on joints shall be pressure rated at 350 psi minimum and flanged joints at 250 psi minimum. Mega lug restraint systems manufactured by EBAA Iron sales of Eastland Texas shall be utilized for restraining push-on joints. Hot dipped galvanized tie rods may be used where restrained joints are close.
- I. VALVES:
  - a. Plug valve shall meet or exceed the latest edition of AWWA C517 and shall conform to BCWWS product specifications.
  - b. Check valve shall meet or exceed the latest revision of AWWA C508 and shall conform to BCWWS product specification.

## 2.2 PUMP

Pumps to be provided by the City and installed by the Contractor. Both pumps are Flygt model number NP 3171.18MT.

### A. Lifting Device:

- 1. Stainless steel lifting chain per manufacturer's recommendations.

## 2.3 CONTROL PANEL

- A. Control panel to be provided by the City and installed by the Contractor.

## 2.4 ACCESSORIES

- A. Sealant: Industrial silicon sealant for pipe penetrations in basin.
- B. Anchor Bolts, Nuts, and Washers: ASTM A709/A709M, Grade 36, bent anchor bolts; ASTM A307, Grade A, nuts; ASTM A126, gray iron washers. Galvanize bolts, nuts and washers in accordance with ASTM A153/A153M.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Inspect the wet well and valve structures for damaged concrete.
- B. Verify inlet and discharge piping connection are size, location, and elevation on Drawings.

### 3.2 PREPARATION

- A. Remove pumps, hatches, piping, valves and other hardware from the wet well and valve vault.
- B. Remove broken and/or damaged concrete to structurally sound concrete.

### 3.3 WET WELL AND VALVE VAULT

- A. Utilizing sand blasting, hydro- grit blasting or other scarificating method approved by the Engineer, remove and clean concrete surface as specified on the drawings.
- B. Rebuild concrete surface that was removed in the cleaning process as specified on the drawings.
- C. Paint and coat wet and valve vault as specified on the drawings.
- D. Install hatches in wet well and valve vault.

### 3.4 PUMP INSTALLATION

- A. Install pumps (provided by the City) including fittings, brackets, discharge piping, check valve to basin rail assembly, lifting device, level transmitter, cleaning system and accessories. Wire pump to junction box.

### 3.5 CONTROL PANEL INSTALLATION

- A. Mount control panel provided by the City for pumping station and connect all motor controls, circuit breaker, starter, control transformer, fuse box, terminal block, alternator, alarm, running lights. Float, level transmitter and cleaning system.

- B. Wire in accordance with requirements of National Electrical Code.
- C. Use 16 AWG control wiring for control circuits and white for neutral grounded conductors.
- D. Use minimum 14 AWG black power wiring.
- E. Number each conductor.
- F. Tin ends of wires with 60/40 lead tin alloy solder.
- G. Locate and connect direct burial cable from control panel to basin junction box.

### 3.6 STATION STARTUP, INITIAL TESTING AND OPERATION

- A. Notify Engineer and the City of Pompano Beach at least three days prior to flow rate testing and start up test. The Engineer and/or the City must be present to witness the test.
- B. Provide startup and initial testing of system. Coordinate and operate pumps in conjunction with other construction of treatment facility if necessary.
- C. Correct failures during test by repairing or replacing malfunctioning parts or equipment or faulty workmanship, regardless of cause, within hours after notification from Engineer.
- D. After correcting failures caused by defective equipment, material, or faulty workmanship, retest until failures are eliminated.
- E. Confirm general sequencing of pump and float operations at basin and control panel are in accordance with performance requirements.
- F. Document and certify startup results in startup report.

### 3.7 LANDSCAPE

- A. Remove all damaged plants; regrade areas damaged by construction and install two (2) inches of top soil over damaged areas.
- B. Install solid sod over the damaged area. Sodding shall match the type of grass existing at the site.
- C. Water, fertilize and maintain (including mowing) the sod areas for three months.
- D. Replace dead and unhealthy sod.

END OF SECTION