

SUMMARY OF MAJOR CHANGES FOR 2019

I. FENCING – SECTION 492

- I.1.1. Security Fence update:
Contact securityservice@jea.com for latest security fence update

II. POTABLE WATER PIPING – SECTION 350

II.1. DISINFECTION OF WELLS AND WATER MAINS:

- II.1.1. Bacteriological sample points ~~should~~ **shall** be installed every 1,000 feet (maximum) and at deadends and stub outs greater than 40 linear feet, at a minimum.
- II.1.2. Water Mains: Samples ~~should~~ **shall** be taken at all dead ends and at intervals of no greater than 1000 feet on continuous pipe runs. All permitted service stubs (domestic, irrigation or fire) ~~should~~ **shall** be sampled at the meter location or the backflow location

II.2. LOCATE WIRE:

II.2.1. Locate Wire Installation:

II.2.2. Contractor shall furnish and install locate wires on all force mains (see Detail S-49 for other locate wire requirements), water mains, chilled water lines, reclaimed water mains, hydrants, branches, and services (see Detail W-44 for other locate wire requirements).

II.2.3. Locate wire must be attached to mains and services with duct tape or plastic ties at each side of bell joint or fitting and at 10 foot intervals along pipeline (at a minimum).

II.2.4. Locate wire shall be brought to 4 foot above grade within a valve box or Locating Station box, as required, at 475 foot intervals (maximum).

II.2.5. Locate wire shall not terminate in an air release valve (ARV) vault. ARV vaults may be corrosive environments for locate wire materials and the vaults are defined as confined spaces.

Locate wire shall be installed in either the 1:00 or 11:00 position on the pipe.

II.2.6. IConnections and splices shall be made at grade within a Valve Box or a Locate Wire Box. Underground connections and splices are not allowed and shall be prohibited. If an underground connection is unavoidable, contact locates before proceeding. Once approved, the spliced tracer-wire joint shall be a waterproof connector, each connection shall be photographed showing a specific identification number (the station and off-set location) written on each waterproof connector. The connector manufacturer shall be: DRYCONN, P/N 90120 - DB Lug Yellow, 5pc. Bag or JEA approved equal.

II.3. LOCATE WIRE TESTING REQUIREMENTS:

II.3.1. Each installed locate wire within the JEA service area shall be tested by the contractor as part of the final inspection procedure, using an approved tester and approved testing equipment.

II.3.2. Definitions:

II.3.3. Approved Tester: A person approved by JEA as proficient in the use of the equipment and who has 12 months experience in the use of the equipment including documented proof of past performance.

II.3.4. Approved Testing Equipment: The following is a list of approved equipment:

II.3.5. Dynatel (3M)-2273 Cable /Fault Locator;

II.3.6. Metrotech 9800XT;

II.3.7. Ditch Witch 950 R/T; or,

II.3.8. JEA pre- approved equal.

II.4. The approved tester shall be listed on the JEA Responsible Bidder List (RBL) for, at minimum, work category GC11 - Line locate services / Wire testing.

II.4.1. The contractor shall prepare the following:

II.4.2. A set of project site drawings showing the stationing and offset for each locate wire box.

II.4.3. A locate wire field testing schedule.

The contractor shall submit the project site drawings and the field testing schedule to the JEA field representative (inspector) for approval. The JEA field representative may elect to be present during the testing period.

II.4.4. The contractor shall provide the approved tester a copy of the project site drawings showing the stationing and offset for each locate wire box.

II.4.5. The approved tester shall place a tone on the locate wire and trace the entire length of the installed wire, spot painting the location at least at 200-foot intervals along the route.

II.4.6. The approved tester shall test the wire depth at 200-foot intervals.

II.4.7. The approved tester shall report (show on project site drawings), where the pipe/wire has less than the allowable minimum cover or more than the maximum allowable cover (see Pipe Cover Section above for pipe cover limits). For pipe/wire which are installed within the acceptable cover limits, no remarks are required. All lateral stub-outs shall be marked and recorded.

II.4.8. The approved tester shall prepare a Locate Wire Box checklist for each locate wire box.

II.4.9. The approved tester shall prepare a final Locate Wire Report. The Locate Wire Report shall be submitted to the JEA field representative for review and approval. The report shall include the following:

II.4.9.1. A signed statement from the approved tester certifying that all installed wire (where shown on the project site drawings), was successfully (sounded), traced with no open breaks.

II.4.9.2. A copy of the project site drawings which indicate all field notes, breaks found/repaired, depths (if installed)

outside the acceptable cover limits), and other applicable field remarks by the approved tester.

II.4.9.3. Copies of the Locate Wire Box checklist for each locate wire box shown on the project site drawings.

II.4.10. A final Locate Wire Report shall be furnished prior to final acceptance of the project or as approved otherwise by JEA.

II.4.11. Locate Wire Testing Requirements:

Installed locate wiring within JEA service area shall be tested by the contractor as part of the final inspection procedure, using a JEA approved tester and approved testing equipment. The approved tester shall be pre-approved by JEA and listed within JEA's GC11. The contractor shall request and obtain approval from the JEA field representative (inspector), of the locate wire field testing schedule. The JEA field representative may elect to be present during the testing period. The contractor shall provide the approved tester a copy of the as-built drawings with the locate wire boxes and stationing depicted on them. A tone shall be put on the locate wire. The technician shall trace the entire length of the installed wire and spot paint the location at least at 200 foot intervals along the route. The depth shall be tested at 200 foot intervals. The approved tester shall report (show on drawings), where the pipe/wire has less than the allowable minimum cover or more than the maximum allowable cover (see above for pipe cover limits). For pipe/wire which is installed within the acceptable cover limits, no remarks are required. All lateral stub-outs shall be marked and recorded. A final Locate Wire Report (JEA form by the approved tester), shall be submitted to JEA for review and approval. The report shall include a signed statement from the approved tester which certifies that all installed wire (where shown on the drawing), was successfully (sounded), traced with no open breaks. The report shall also include a copy of the project site drawings which indicate all field notes, breaks found/repaired, depths (if installed outside the acceptable cover limits), and other applicable field remarks by the approved tester. A Certified copy of the JEA form and marked up drawings shall be furnished prior to final acceptance of the project or as approved otherwise by JEA.

II.4.12. III.7.2.13.1. Definitions:

II.4.13. Approved Testing Equipment shall include variable frequency controls, digital depth read out and tone continuity. The following is a list of approved equipment — Dynatel (3M) 2273 Cable/Fault Locator, Metrotech 9800XT, Ditch Witch 950 R/T or JEA pre-approved equal.

II.4.14. III.7.2.13.2. Approved Tester:

II.4.15. A person approved by JEA as proficient in the use of the equipment and has 12 months experience in the use of the equipment including documented proof of past performance.

II.4.16. III.7.2.14. Locate Wire Installation:

II.4.17. Contractor shall furnish and install locate wiring on all water mains (both PVC and ductile iron) and on water services 10 LF or greater in length (see Detail W-44 for other locate wire requirements). Locate wire must be attached to water mains and services with duct tape or plastic ties at each side of bell joint or

fitting and at 10 foot intervals along pipeline (at a minimum). Locate wire shall be brought to grade within a valve box or Locating Station box, as required, at 475 foot intervals (maximum), 2 foot of slack is required at each access point and locate wire box. Locate wire shall be installed in box and along pipeline as detailed in the JEA Standard Details. Locate wire shall be installed in either the 1:00 or 11:00 position on the pipe. Connection or splices underground which are not inside a locate box (or valve box), shall be prohibited. If an underground connection is unavoidable, spliced tracer wire joint shall be a waterproof connector, each connection shall be photograph showing a specific identification number (the station off set location) written on each waterproof connector. The approved manufacturer is: DRYCONN, P/N 90120 DB Lug Yellow, 5pc. Bag or JEA approved equal.

III. WATER VALVES AND APPURTENANCES – SECTION 351 (REVISION IN YELLOW)

- III.1.1. **GENERAL:** Isolation gate valves shall be provided at water main branches in two directions on a tee and in three directions on a cross. Isolation gate valves shall be provided on water mains at a maximum of 500 foot intervals within high density residential, commercial or industrial developments, at a maximum of 1000 foot intervals within residential areas, and at a maximum of 2500 foot intervals on transmission mains with a limited number of service connections. Isolation gate valves shall be provided on water main stub outs for future connections.
- III.1.2. **Combination Air Valves:** Combination air valve shall be automatic float operated, all stainless steel trim and shall be designed for air release only (a check valve on the outlet is required to prevent air from re-entering the pressurized water main). Valve shall be stainless steel or Nylon body including 1" inlet (min.), stainless steel compound lever design and compliance with AWWA C-512. Install combination air valve with double stainless steel band saddle and corporation stop (connected directly into saddle with no nipples). All 2' and smaller piping associated with this installation shall be galvanized (SCH 40) or stainless steel. Piping larger than 2" size shall be ductile iron. If the installation of the ARV requires a manhole, then the manhole shall be installed similar to the requirements of wastewater construction detail S-29, including off-set piping, support bracket and other appurtenances as shown (no specialty interior manhole lining; stainless steel pipe is optional). Acceptable air valve: ARI D-025-P or JEA approved

IV. WASTEWATER MANHOLES – SECTION 427

- IV.1. **MANUFACTURER WARRANTY:**
The Manufacturer shall supply to JEA a fifty (50) year corrosion unconditional warranty. Current JEA approved Pre-cast Concrete manufacturers two (2) year warranty shall be grandfathered in for twelve (12) months. The warranty shall include materials and installation and shall constitute complete replacement and delivery to the site of materials and installation of same to replace defective materials or defective workmanship with new materials/workmanship conforming to the specifications.

IV.2. MANHOLE APPLICATION TABLE:

Selection Table for Application of new and Rehab manhole construction	Polymer Concrete Manhole	Precast Concrete Manhole	Fiberglass Manhole
Pipe to 12" New Construction	Yes	Yes	
Pipe 12" and greater	Yes		
Force-main to manhole	Yes		
High line to manhole	Yes		
Interceptor/splitter box	Yes		
Junction manhole	Yes		
Rehab manhole	Yes	*Yes	*Yes
Manhole depth less than 10'	Yes	Yes	
Manhole depth greater than 10'	Yes		
Inside/outside drop	Yes	*Yes	
ARV manholes	Yes		
<p>* Required: Liner manufacturer to certify manhole structural integrity for rehab. Manufacturer of the chemical resistant surface shall provide a 10-year warranty against chemical deterioration of the manhole structure and the chemical resistant surface.*</p>			

IV.1. POLYMER CONCRETE MANHOLES:

Polymer Concrete Manhole Approved Applications:

IV.1.1.1. Reference I.3 Manhole Application table, approved all areas.

Reference Standards:

- IV.1.1.2. ASTM C 478 (most current) Standard Specification for Precast Reinforced Concrete Manhole Sections.
- IV.1.1.3. ASTM C 579 (most current) Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic, Surfacing, and Polymer Concretes.
- IV.1.1.4. ASTM C 443 (most current) Standard Specification for Joints for Concrete Pipe and Manholes Using Rubber Gaskets.
- IV.1.1.5. ASTM C 580 (most current) Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
- IV.1.1.6. ASTM C 857 (most current) Standard Practice for Minimum Structural Design Loading for Underground Utility Structures.
- IV.1.1.7. ACI 350-06 Code Requirements for Environmental Engineering Concrete Structures & Commentary.
- IV.1.1.8. ACI 440.1R-15 Guide for the Design and Construction of Structural Concrete Reinforced with Fiber-Reinforced Polymer (FRP) Bars.
- IV.1.1.9. ACI 548.6R-96 Polymer Concrete-Structural Applications State-of-the-Art Report.

- IV.1.1.10. ASTM D 648 (most current) Test Method for Deflection Temperature of Plastics Under Flexural Load in Edgewise Position.
- IV.1.1.11. ASTM D 6783 (most current) Standard Specification for Polymer Concrete Pipe.
- IV.1.1.12. ASTM D 2584 (most current) Test Method for Ignition Loss of Cured Reinforced Resins.
- IV.1.1.13. ASTM C 923 (most current) Standard Specifications for Resilient Connectors between Concrete Manholes Structures and Pipe.
- IV.1.1.14. ASTM C 990 (most current) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections using Preformed Flexible Joint Sealants.
- IV.1.1.15. ASTM C 497 (most current) Test Methods for Concrete Pipe, Manhole Sections, or Tile.
- IV.1.1.16. California Greenbook Standard Specifications for Public Works Construction Section 211-2.

Submittals

- IV.1.1.17. Submit manufacturer's data and details of following items for approval:
 - IV.1.1.17.1. Shop drawings of manhole sections, base units and construction details, jointing methods, materials, and dimensions.
 - IV.1.1.17.2. Summary of criteria used in manhole design including, as minimum, material properties, loading criteria, and dimensions assumed. Include certification from manufacturer that polymer concrete manhole design meets or exceeds the load and strength requirements of ASTM C 478 and ASTM C 857, reinforced in accordance with ACI 440.1R-15. Include current ISO 9001:2008 certification.
 - IV.1.1.17.3. Frames, grates, rings, and covers.
 - IV.1.1.17.4. Materials to be used in fabricating pipe drop connections.
 - IV.1.1.17.5. Materials to be used for pipe connections.
 - IV.1.1.17.6. Materials to be used for stubs and stub plugs, if required.
 - IV.1.1.17.7. Proof of independent Chemical Resistance testing conducted in accordance with the Standard Specifications for Public Works Construction (California Greenbook) Section 211-2.
 - IV.1.1.17.8. Submitted sealed drawings by a registered Professional Engineer.

Products

- IV.1.1.18. Polymer Concrete Manholes:
 - IV.1.1.18.1. Provide polymer concrete manhole sections, monolithic base sections and related components referencing to ASTM C 478. ASTM C 478 material and manufacturing is allowed compositional and dimensional differences required by a polymer concrete product.

- IV.1.1.18.2. Provide base riser section with monolithic floors, unless shown otherwise.
- IV.1.1.18.3. Provide riser sections joined with bell and spigot / ship-lap design seamed with butyl mastic and or rubber gaskets (ASTM C 990) so that on assembly, manhole base, riser and top section make a continuous and uniform manhole structure.
- IV.1.1.18.4. Construct riser sections for polymer concrete manholes from standard polymer concrete manhole sections of the diameter indicated on drawings. Use various lengths of polymer concrete manhole sections in combination to provide correct height with the fewest joints.
- IV.1.1.18.5. Design wall sections for depth and loading conditions with wall thickness as designed by polymer concrete manufacturer.
- IV.1.1.18.6. Provide tops to support AASHTO HS-20 or HL-93 or vehicle loading or loads as required and receiving cast iron frame covers or hatches, as indicated on drawings.
- IV.1.1.19. Design Criteria:
 - IV.1.1.19.1. Polymer Concrete Manhole risers, cones, flat lids, grade rings and manhole base sections shall be designed by manufacturer to meet the intent of ASTM C 478 with allowable compositional and sizing differences as designed by the polymer concrete manufacturer.
 - IV.1.1.19.2. AASHTO HS-20 or HL-93 design or as required loading applied to manhole cover and transition and base slabs
 - IV.1.1.19.3. Polymer manholes will be designed based upon live and dead load criteria in ASTM C 857 and ACI 350-06
 - IV.1.1.19.4. Unit soil weight of 120 pcf located above portions of manhole, including base slab projections
 - IV.1.1.19.5. Internal liquid pressure based on unit weight of 63 pcf
 - IV.1.1.19.6. Dead load of manhole sections fully supported by polymer concrete manhole base
- IV.1.1.20. Design:
 - V. Polymer Concrete Manhole risers, cones, flat lids, grade rings and manhole base sections shall be designed by manufacturer to meet loading requirements of ASTM C 478, ASTM C 857 and ACI 350-06 as modified for polymer concrete manhole design as follows:
 - V.1.1.1.1. Polymer Concrete Mix Design shall consist of thermosetting resin, sand, and aggregate. No Portland cement shall be allowed as part of the mix design matrix. All sand and aggregate shall be inert in an acidic environment

- V.1.1.1.2. Reinforcement – Shall use acid resistant reinforcement (FRP Bar) in accordance with ACI 440.1R-06 as applicable for polymer concrete design
- V.1.1.1.3. The wall thickness of polymer concrete structures shall not be less than that prescribed by the manufacturer's design by less than 95% of stated design thickness
- V.1.1.1.4. Thermosetting Resin - The resin shall have a minimum deflection temperature of 158° F when tested at 264 psi (1.820 mPa) following Test Method D 648. The resin content shall not be less than 7% of the weight of the sample as determined by test method D 2584. Resin selection shall be suitable for applications in the corrosive conditions to which the polymer concrete manhole structures will be exposed.
- V.1.1.1.5. Each polymer concrete manhole component shall be free of all defects, including indentations, cracks, foreign inclusions and resin starved areas that, due to their nature and degree or extent, detrimentally affect the strength and serviceability of the component part. Cosmetic defect shall not be cause for rejection. The nominal internal diameter of manhole components shall not vary more than 2%. Variations in height of two opposite sides of risers and cones shall not be more the 5/8 inch. The under run in height of a riser or cone shall not be more than ¼ in/ft of height with a maximum of ½ inch in any one section
- V.1.1.1.6. Marking and Identification - Each manhole shall be marked with the following information - Manufacturer's name or trademark, Manufacturer's location and Production Date
- V.1.1.1.7. Manhole joints shall be assembled with a bell/spigot or shiplap butyl mastic and/or gasketed joint so that on assembly, manhole base, riser and top section make a continuous and uniform manhole. Joint sealing surfaces shall be free of dents, gouges and other surface irregularities that would affect joint integrity
- V.1.1.1.8. Minimum clearance between wall penetrations and joints shall be per manufacturer's design
- V.1.1.1.9. Construct invert channels to provide smooth flow transition with minimal disruption of flow at pipe-manhole connections. Invert slope through manhole is as indicated on drawings. All precast base sections to be cast monolithically. Polymer bench and channel are to be constructed with all polymer concrete material. **In the event that the manhole bench and invert are to be hand built, utilizing traditional brick and Portland cement mortar, after curing, all Class "C" concrete benches, channels, and**

inverts shall be coated with an approved epoxy coating. Coating shall be applied to all cold joints between horizontal and vertical surfaces, continuing a minimum of six (6") inches up the vertical surface. Extended ballast slab requirements for buoyancy concerns can be addressed with cementitious concrete material.

V.1.1.1.10. Provide resilient connectors conforming to requirements of ASTM C 923 or other options as available. All connectors are to be water tight. Install approved resilient connectors at each pipe entering and exiting manholes in accordance with manufacturer's instructions

Quality Control:

V.1.1.2. Facility Quality Control should be maintained by adhering to ISO 9001:2008 for manufacturing. All fabricators will be ISO 9001:2008 Certified. All fabrication will take place in an all polymer concrete fabrication facility. At no time will the polymer concrete fabrication facility share the facility with a cementitious precast product production facility. Fabricator is also to provide references of 5 previous projects in the last 5 years performed with both owner and contractor for reference and review by owner. Polymer concrete shall be cast in a polymer only facility and shall not be manufactured in a cementitious concrete facility

Grouting:

V.1.1.3. All materials needed for grouting and patching will be a polyester mortar compound provided by the manufacturer or an approved equal by the manufacturer. All holes in sections used for handling and annular spaces, around influent and effluent pipes, shall be filled using the material listed above AND coated with a manufacturer approved compatible epoxy coating.

Manufacturer:

V.1.1.4. Armorock LLC, Boulder City, Nevada www.armorock.com, 702-824-9702

V.2. PRECAST CONCRETE WASTEWATER MANHOLES:

Wastewater manhole bases, sections and cones shall conform to the requirements of ASTM C478, "Specification for Precast Reinforced Concrete Manhole Sections" with the exception of Section 10(a), except as modified herein. Cement shall meet the requirements of ASTM C150, "Specification for Portland Cement Type H". Concrete shall meet the minimum requirements for Class "A" as specified in Chapter II. 5. - Section 437- Concrete Work. Minimum wall thickness shall be 1/12 the inside diameter of the manhole in inches plus 1 inch. If requested by JEA, the required minimum strength of concrete shall be confirmed by making and testing 4 standard cylinders at seven days in accordance with Chapter IV. 1. - Section 437- Concrete Work. Rings shall be custom-made with openings to meet indicated pipe alignment conditions and invert elevations. ~~Junction manholes (the manhole closest to the wetwell/pump station) shall be 5 foot diameter (minimum).~~

V.2.1. Precast Concrete Manhole Approved Applications:

Reference I.3 Manhole Application Table, approved for new construction with maximum pipe diameter of 12" and depth is 10' or less. If manhole requires inside/outside drop or rehabilitation shall be warranted for 10 years.

VI. INSTALLATION

VI.1. PRECAST POLYMER AND CONCRETE WASTEWATER MANHOLES:

Setting Wastewater Manhole Bases:

Wastewater manhole bases shall be set level on bedding consisting of 12 inches (at a minimum) of granular material (57 stone) as detailed in the JEA Water and Wastewater Details. For all manholes deeper than ten (10) feet (from the finish elevation to the invert), the Contractor shall be required to schedule the JEA representative to be in attendance and observe/inspect the bedding foundation prior to the base being set. The JEA representative shall provide written "no objection" to the Contractor for the setting of the manhole base.

Installing Manhole Sections:

VI.1.1.1. During the handling of all manholes, the contractor shall protect the manhole and not allow a chain, cable or other lifting line to damage the joint surfaces. Spreader bars, wood blocks or other devices shall be utilized to prevent damage to the manhole. Any manhole section found to have defects, included but not limited to leaks and cracks shall be removed and replaced.

VI.1.1.2. The manhole sections shall be set so the manhole will be vertical and with section in true alignment. Construction shall include:

VI.1.1.2.1. Cleaning all joint surfaces (remove all sand, oil, debris & other foreign items) and provide additional primer if recommended by the joint manufacturer.

VI.1.1.2.2. The joint sealant (Ram-Neck, ConSeal or other JEA approved joint sealant) and the manhole surfaces shall be dry during the installation period (shall not be installed if wet or during rain events).

VI.1.1.2.3. Joint sealant is applied to both the top & bottom joint surfaces (Double Ring Method). The joint sealant shall be installed continuously around all joints with the ends placed butt to butt (not overlapped & no open gaps between sealants).

VI.1.1.2.4. The excess joint sealant shall be trimmed flush to the inside surfaces of the manhole. Trim the outside surfaces if an exterior joint sealant/tape is applied.

VI.1.1.3. Apply a special primer and an "Exterior Joint Sealant Membrane" to the outside surfaces of all manhole joints/seams which are located below the top cone section. Apply the primer and joint membrane in accordance with the recommendations of the membrane manufacturer.

VI.1.1.4. Manholes with leaking joints (infiltration of ground water) will not be accepted by JEA. JEA will not accept leak repairs on new construction of manholes. The leaking manhole is to be removed and replaced.

- VI.1.1.5. The gravity wastewater pipes and rubber boots shall be clean and lubricated during assembly to provide for a leak free connection at the manhole. To protect the inside surfaces of the rubber manhole boots, **an epoxy packing grout non-shrink grout** (not regular concrete) coated with an **approved compatible epoxy coating bituminous waterproofing** shall be applied to the void/open areas around the boot. All rubber boots observed to be leaking shall be removed and replaced by the Contractor prior to final acceptance by JEA. No repair shall be allowed. All cost for removal and replacement shall not be paid for separately but shall be merged with the associated item of work.

Epoxy Packing Grout Metallic Non Shrink Mortar:

All holes in sections used for handling and the annular space between the wall and entering pipes shall be thoroughly plugged with an **approved epoxy packing grout non-shrinking mortar or grout** applied and cured in strict conformance with the manufacturer's recommendations so that there will be zero leakage through openings and around pipes. **The grout shall be finished smooth and flush with the adjoining interior and exterior manhole wall surfaces. Coat packing grout on the interior and exterior surfaces with an approved compatible epoxy coating as specified above.**

VI.2. FLOW CHANNELS:

Flow channels in the manhole base shall be formed of Class "C" concrete, while the manhole is under construction. Flow channels shall be solid concrete or concrete with solid filler blocks. No rubble shall be allowed. Cut off pipes at inside face of the manhole and construct the invert to the shape and size of pipe indicated. All inverts shall follow the grade of the pipe entering the manhole. A change in direction of the wastewater and entering branch or branches shall be laid out in smooth curves of the longest possible radius which is tangent to the center lines of adjoining pipelines. **After curing, all Class "C" concrete benches, channels, and inverts shall be coated with an approved epoxy coating. Coating shall be applied to all cold joints between horizontal and vertical surfaces, continuing a minimum of six (6") inches up the vertical surface.**

VII. GRAVITY WASTEWATER – SECTION 428

VII.1.1. **Lateral Inspection:**

All laterals shall be inspected to insure proper connection to the gravity main.

VIII. WASTEWATER FORCE MAINS – SECTION 429

VIII.1.1. Locate Wire Report:

Contractor shall submit for approval a final Locate Wire Report as described in Paragraph III.10.2. of this section prior to substantial completion. The JEA representative shall scan the Locate Wire Report and ensure the documents are filed in the electronic file folder for the project.

VIII.1.2. **LOCATE WIRE:**

VIII.1.2.1. Locate wire shall be installed on all PVC, DI and HDPE wastewater force main piping, potable water main piping, reclaimed water main piping, potable water services 10 LF or greater in length, and reclaimed water services 10 LF or greater in length.

VIII.1.2.2. No locate wire shall be installed on above ground installations.

VIII.1.2.3. Refer to details for minimum installation requirements.

VIII.1.2.4. Locate wire shall be 12 gauge, copper wire with .03 inches (minimum) HDPE insulation thickness, .141 inches (minimum) O.D. rated break load 250 lbs., 30 volt, and 21% IACS.

VIII.1.3. The outside color of the wire shall be as follows:

VIII.1.3.1. Green for wastewater force mains

VIII.1.3.2. Blue for potable water mains and services

VIII.1.3.3. Purple for reclaimed water mains and services

VIII.1.3.4. White for Chilled water lines

VIII.1.4. Locate wire manufacturers shall be:

VIII.1.4.1. Copperhead;

VIII.1.4.2. Protrace; or,

VIII.1.4.3. JEA approved equal.

VIII.2. FORCE MAIN CONNECTION TO EXISTING MANHOLE:

Where a new force main is connected into an existing manhole the manhole shall be properly prepared to receive the new force main and repaired or replaced as indicated or specified. Replacement manhole shall be Polymer Concrete. Manhole inverts shall be reshaped as required by the new connection to provide a smooth flowing channel of the exact shape of the wastewater to which it connects. Manholes shall receive a protective coating as specified in Chapter IV. 6. - Section 446 of these specifications. An approved gate valve or plug valve must be installed immediately prior to the 45° bends going into the manhole and shall be constructed in accordance with Detail S-18.

IX. WASTEWATER VALVES AND APPURTENANCES – SECTION 430

IX.1. GATE VALVES:

The typical gate valve spacing shall be every 1000 ft. maximum and upstream at branches of intersecting force mains.

IX.2. COMBINATION AIR VALVES:

ARV Requirements:

IX.2.1. **Materials:**

IX.2.1.1. The ARV body material shall be 316 Stainless Steel (316 SS).

IX.2.1.2. Top assemblies, covers, or external parts that attach to the outside of the ARV body shall be: 316 SS, polypropylene, polyoxymethylene (POM),

polyethylene, or acrylonitrile butadiene styrene POLYLAC® PA-737.

IX.2.1.3. ARV float material shall be 316 SS, polyethylene, polypropylene, POM, polyurethane, high-density polyurethane (HDPE), or ethylene propylene diene monomer rubber (EPDM).

IX.2.2. Operational Requirements:

IX.2.2.1. ARV shall have large air / vacuum port to allow large volumes of air to be exhausted during pipeline filling and to re-enter the pipeline during draining.

IX.2.2.2. ARV shall have a smaller air release orifice to vent the pipeline under normal operating conditions.

IX.2.2.3. ARV shall be capable of a zero-leakage seal at less than 3 psig.

IX.2.2.4. ARV shall have a maximum operating pressure of at least 150 psig.

IX.2.2.5. ARV's 4" to 6" shall be equipped with surge protection as furnished by approved ARV manufacturers.

IX.2.2.6. ARV shall be equipped with backwash appurtenances on the body as furnished by approved ARV manufacturers.

IX.2.3. ARV Markings:

Mark valves per Section 6.1 of ANSI/AWWA C512 and include:

IX.2.3.1. Manufacturer

IX.2.3.2. Model

IX.2.3.3. Inlet Diameter

IX.2.3.4. Large Air/Vacuum Port Diameter

IX.2.3.5. Small Air Release Orifice Diameter

IX.2.3.6. Maximum working pressure rating

IX.2.3.7. Minimum Sealing Pressure

IX.2.3.8. Serial Number

IX.2.3.9. JEA Asset ID

IX.2.4. Connection Type and Height:

Connection shall be female National Pipe Thread (FNPT) for 2-inch diameter inlets and flanged for 3-inch diameter and larger with maximum total ARV height as specified below:

Inlet Size (in)	Connection	Maximum Height (in)
2	NPT	22.0
3	Flanged	25.6
4	Flanged	34.5
6	Flanged	40.0

IX.2.5. Manufacturers:

Approved manufacturers include: A.R.I, H-TEC and Vent-O-Mat. The following are approved ARV models:

IX.2.5.1. A.R.I: models D-25ST and D-26 NS

IX.2.5.2. H-TEC: model 989 (2-inch only) and model 986 (all sizes)

IX.2.5.3. Vent-O-Mat: model RGX II

IX.2.6. ARV Heights:

ARV Height (inches)					
ARV	2 (NPT)	3 (NPT)	3 (FLG)	4 (FLG)	6 (FLG)
ARI D-025-ST	17.9	17.9	18.1	18.1	-
ARI D-26 NS	21.8	24.4	24.4	34.5	39.4
VOM RGX II	16.0	-	25.6	25.6	31.45
H-TEC 989	18.9	-	-	-	-
H-TEC 986	24.4	24.4	24.7	24.7	24.7

Total Installed Height (inches)					
ARV	2 (NPT)	3 (NPT)	3 (FLG)	4 (FLG)	6 (FLG)
ARI D-025-ST	25.1	25.1	25.3	25.3	-
ARI D-26 NS	29.0	36.6	42.2	53.3	64.7
VOM RGX II	23.2	-	43.4	44.4	56.7
H-TEC 989	26.1	-	-	-	-
H-TEC 986	31.6	36.6	42.5	43.5	50.0

IX.2.7. Manufacturer Warranty :

The Manufacturer shall supply to JEA a ten (10) year unconditional warranty. The warranty shall include replacement, delivery and installation.

In most cases, an air release valve shall be utilized in lieu of a combination (air release and vacuum) valve. Combination valves shall only be utilized if a major vacuum condition exist and is specified by the design engineer. This will assist JEA in minimizing wastewater odor complaints within our wastewater service area. See the Approved Materials Manual for a list of approved air valves. For construction standards see Detail S-29.

Air Release Valve:

Air release valve shall be 2 inch inlet (minimum), 316 stainless steel internal trim (including float, lever arm, leakage, etc.), 316 stainless steel assembly bolts, stainless steel backwash accessories including quick disconnects and stainless steel ball valves (gate valve are also acceptable). The body of the air valve shall be 316 stainless steel. Short body style shall only be substituted for the standard size when head clearance (for the standard style) is not available.

Combination Air Valve:

Combination (air release and vacuum release valve) air valves shall meet the requirements as stated above for air release valves, at a minimum.

X. SUBMERSIBLE WASTERWATER PUMPING STATIONS – SECTION 433

X.1. WET WELL MANUFACTURER WARRANTY:

X.1.1. The Manufacturer shall supply to JEA a fifty (50) year corrosion unconditional warranty. Current JEA approved Pre-cast Concrete manufacturers two (2) year warranty shall be grandfathered in for twelve (12) months. The warranty shall include materials and installation and shall constitute complete replacement and delivery to the site of materials and installation of same to replace defective materials or defective workmanship with new materials/workmanship conforming to the specifications.

X.2. AS-BUILT DRAWINGS:

As-built drawings shall be required on all Wastewater, force main and pump station projects, including projects for JEA, City of Jacksonville, JTA, DOT, private developments (utilities to be dedicated to JEA), and other City Authorities, etc. As-built drawings shall be in accordance with specification Chapter VI. 1. - Section 501, entitled "As-built Drawings" and as defined here-in. As-built drawings shall be reviewed and approved by JEA. The cost to provide as-built drawings shall be included as part of the related work requirements or general conditions for the utility work. The contractor shall submit preliminary "As-Built" drawings to JEA for Development and O & M review prior to pump station pre start-up. JEA will review the preliminary pump station "As-Built" during the pre-start-up for accuracy. The preliminary "As-Built" drawing comments will be returned to the contractor following the pre start-up. Once the "As-Built" is finalized and Development has issued the as-built approval letter, the Certificate of Completion (COC) can be processed.

~~The contractor shall submit preliminary "As Built" drawings to Development for review prior to pump station start up. JEA will review the pump station "As Built" during the start up for accuracy. The "As Built" drawing comments will be returned to the contractor following the start up. Once the "AS Built" is finalized and approved by JEA. Development will process the Certificate Of Completion (COC).~~

X.3. MATERIALS:

All material shall be free from defects impairing strength and durability and be of the best commercial quality for the purpose specified.

X.3.1. Unless indicated otherwise on the drawings, all metal components in the wet well, with the exception of pumps and motors shall be 316 stainless steel as specified here in or on the plans.

X.3.2. The pump supplier to ensure unit compatibility shall supply the pumps, motors and guide rail system.

X.3.3. Station piping shall conform to JEA Water and Wastewater Standards Chapter IV. ~~3~~ - Section 429, entitled Wastewater Force Mains and Chapter IV.—4. Section 430 entitled Wastewater Valves and Appurtenances. Specifically, station piping for Class I, Class II, Class III and Class IV stations shall be plumbed and aligned according the latest ASTM, AWWA standards, any piping ill-regularities shall be removed and replaced.:

X.3.3.1. Piping within the wet well shall be flanged 316 stainless steel, or piping (schedule 40, one-piece construction with no butt-welds with exception of

pump-out pipe). Fittings within the wet well shall be flanged 316 stainless steel. All nuts, bolts and accessories within the wet well shall be 316 stainless steel.

X.3.3.2. Pipe outside of the wet well and above ground shall be 316 stainless steel, (Schedule 40, one-piece construction with no butt welds with exception of pump-out pipe). All bolts, washers and nuts shall be 316 stainless steel, threaded bolts and nuts shall be coated with "Never Seize" type coating.

X.3.3.3. Fittings may be 316 stainless steel flanged type manufactured in accordance with ASTM-A774, AWWA C110 of the same raw material and in the same thicknesses as the pipe. Fittings may also be flanged ductile iron with specialty inside coating. The fittings utilized at wastewater pump station sites shall only be flanged stainless steel (no butt weld fittings) or flanged ductile iron with specialty inside coating. The finish on the raw material, manufactured to ASTM A-240 will be No. 1, HRAP (hot rolled annealed and pickled) or better. The finish on the completed pipe and fittings shall be as specified in ASTM A778 and A774, respectively. Transition from PVC to stainless steel flange to mechanical joint.

X.4. SELECTION OF PUMP STATION STANDARDS:

JEA Pump Station Standards are available in Auto CAD format, on the jea.com website. The selection of a pump station type shall comply with the following:

Pump Station Type	Pump Station Maximum Peak Flow (GPM)	Pump Station Maximum ADF, & EDU	Emergency Operating Requirements	Odor Control Requirements	Additional Design Requirements	Influent Solids Removal Management System
Class I	0 – 440 GPM	174,999 GPD 499 EDU	Generator or Pump Engine*	Not required	Flow meter and Smart meter.	
Class II	441 – 1000 GPM	175,000 – 436,450 GPD 500 - 1247 EDU	Generator or Pump Engine	Required III.6.3.9.	Flow meter and Smart meter	

Class III	1001 – 2000 GPM	436,451 - 971,250 GPD 1,248 – 2,775 EDU	Generator and 2 Pump Engines	Required III.6.3.9.	Flow meter and Smart meter Electric power, controls, building with ventilation.	Required 111.6.7
Class IV	2001 GPM and Above	971,250 GPD and above 2,775 EDU and above	Generator and 2 Pump Engines	Required III.6.3.9.	Flow meter and Smart meter Electric power, controls, building with ventilation.	Required 111.6.7

* Exceptions for generators or pony pumps on Class I Stations: shall require a three (3) hour peak flow holding time in the gravity systems. Overflow manholes targeted and overflow retention designed to minimize impact.

- X.4.1. The pump station **Peak Flow** GPM excludes the flow from the permanently installed stand-by pump and any emergency standby by pump.
- X.4.1. All pumping station emergency back-up system, separate or combined, are to be sized to **Peak Flow**. ~~the same rate as all permanent pumps, pumping simultaneous.~~
- X.4.2. ~~All Class One, Class, II, III and IV pumping stations, both rehabilitation and new construction, shall include an ultrasonic or magnetic flow meter (indicating, totalizing, data transmission via scada and recording capabilities). Approved ultrasonic manufacturers Flexim – Fluxus-7407 with or JEA equal. Ultrasonic meters shall have 24"Hx24"Wx18"D meter enclosure .1255052 aluminum standard white. Approved enclosure manufacturer Schaefer's. Magnetic flow meters shall have a by-pass configuration located within the fenced area. Approved manufacturers: Khone - Enviromag 2000, Endress+Hauser (EH) – Proline Promag W-400, Siemens Mag 5000/6000 or JEA Equal.~~
- X.4.3. ~~All Class Three and Four pumping stations, both rehabilitation and new construction, shall include a magnetic or Uflow meter (indicating, totalizing, data transmission via scada and recording capabilities) with bypass configuration located within the fenced area. Approved manufacturers: Khone - Enviromag 2000, Endress+Hauser (EH) – Proline Promag W-400, Siemens Mag 5000/6000 or JEA Equal.~~
- X.4.4.** All-Class Three and Four pumping stations, both rehabilitation and new construction, with an influent pipe diameter greater than 30" shall include an influent solids management system. Solids management system shall consist of Dual-Channel mechanic bar screen (0.75" to 1.5" spacing require with debris storage, offsite deposal method and odor control, or

Grinder/communicator/macerator, or similar technology approved by JEA, unless exempted by regulating authorities.

X.4.5. Odor Control Requirements:

X.4.5.1. All stations with a maximum peak flow greater than 441 GPM shall include electrical service sizing, 30A breaker, water line, wall penetrations with duct work, all stubbed-out in gravel area for future odor control.

X.4.5.2. ~~All stations with a maximum peak flow greater than 1000 GPM shall include an odor control system.~~

XI. SUBMERSIBLE PUMPS

XI.1. OPERATING CONDITIONS AND UNIT SIZES:

XI.1.1. Operating conditions and unit sizes shall be as shown on the drawings. Pump shut-off head shall be a minimum of 15% greater than the pump design head for the "all pumps on" condition, such that a pump with a design point of 500-GPM at 100-FT-TDH must provide a shut-off head greater than 115-FT-TDH. ~~The pump design operating conditions shall be within 10% +/- of the best efficiency point, unless otherwise approved by JEA.~~ When possible, the pump selection shall be made in the center of the family of curves

XI.1.1. **Motors 3600 rpm:**

The pump shall be driven by a totally submersible electric motor at 3600 RPM (max.). Pump motor shall be of sufficient horsepower as to be non-overloading over the entire length of the pump curve. The stator housing shall be a watertight casing. Motor insulation shall be moisture resistant, Class F, 180 degree C. at a minimum. All motors shall be VFD rated including class H winding insulation. Motor shall be NEMA Design B for continuous duty at 40 degree C ambient temperature and designed for at least 30 starts per hour. Bearings: shall have a minimum L10 life of 50,000 hours. Seals: tandem seal system consisting of two independent seals manufactured from Tungsten Carbide. Impeller: shall have Hard Iron Impellers (25% chrome cast iron with leading edges hardened to Rc 60) Volutes/suction covers: shall require ASTM A-48, Class 35. Refer to section XI approved materials, plate AS-603

XI.2. PUMP WARRANTY (SOLID HANDLING):

The following warranty conditions shall also apply to existing pump station pump replacements.

XI.2.1. The manufacturer shall warrant to JEA for permanent installation in municipal sewage service non-clog submersible pump and motor against defects in materials and workmanship including normal wear and tear to the following parts for a period of 5 years, mechanical seals, bearings, shafts, motor electrical cables and motor stators. The warranty shall include no less than 100% coverage for original equipment manufacturer (OEM) parts and in-shop labor for pump/motor repairs for the full 5 years at NO COST to JEA.

This warranty shall not apply to parts that fail due to abuse, neglect, mishandling, or acts of God. The warranty period shall commence upon the date of final acceptance for the pumping station and/or of the replacement pump by JEA. **Note: Sand, rags and other debris is normal in JEA's service area, JEA shall allow no exceptions on pump failures within the 5 year warranty for this reason.**

XII. FRAME AND COVERS

Access frame and covers shall be suitable size for pumping units furnished and shall be constructed of skid-proof aluminum with a minimum load rating of 300 lbs. /sq. ft. or H-20 traffic loading when called for on the drawings. Frame and covers shall be furnished complete with stainless steel staple assembly (**NOT RECESSED**) for the locking mechanism, hold-open device, upper guide holder and cable holder. If door is not within a private fenced area, the locking mechanism shall be recessed type. Access covers shall be double door for duplex stations and triple door for triplex stations. Access covers shall be hinged to open as indicated on the drawings. Hatches shall be sized to provide a 4-inch minimum clearance between hatch and pump volute (measured from all sides and includes the pump and rail system).

Minimum size total hatch opening shall be **36-42** inches by 48 inches for duplex stations and **36-42** inches by 96 inches for triplex stations. ~~Class One pump station hatches shall be sized to adequately remove pumps and shall not be required to adhere to the minimum size requirements.~~ All hinges, fasteners and miscellaneous hardware shall be 316 stainless steel. For tamper proof and security purposes, the hinges shall be bolted to the door(s) with stainless steel carriage bolts and nuts. The nuts shall be welded to the bolts on both the door(s) and frame with 316L. JEA will provide pad locks, as required.

XII.1. STATION ELECTRICAL SERVICE

The Contractor shall provide complete new electrical service for each lift station, including coordination of electrical service selection and approval by JEA and the serving electrical utility company. Each lift station electrical service shall include complete primary and secondary electrical service equipment, metering and installation in accordance with these standards and the serving electrical utility company requirements.

XII.1.1. Unless specifically unavailable from the serving electrical utility company, the electrical service to each lift station shall be three phase. The basis of design lift station electrical service to be requested from the serving electrical utility company shall be as follows:

XII.1.1.1. 20 HP and below: 240/120 volt, 3 phase, open delta, full voltage motor starting, **15 starts per hour for 1800 or 30 starts hour 3600 rpm pumps**

XII.1.1.2. 21 HP thru 40 HP: 480/277 volt, 3 phase, wye, full voltage motor starting, **15 starts per hour for 1800 or 30 starts hour 3600 rpm pumps**

XII.1.1.3. 41 HP and above: 480/277 volt, 3 phase, wye, reduced voltage motor starting, **10 15 starts per hour for 1800 or 30 starts hour 3600 rpm pumps**

XII.1.2. Electrical service size shall be based on these standards and N.E.C. requirements. The minimum electrical service size shall be **200** ~~100~~ amps. ~~Where the electrical service requirements exceed 100 amps, but are less than or equal to 200 amps, the electrical service size shall be 200 amps.~~ Where the electrical service requirements exceed 200 amps, but are less than or equal to.

XII.1.1. ~~Generator Disconnect Switch:~~ **Manual Transfer Switch:**

A NEMA 3R enclosed ~~generator disconnect~~ **manual transfer** switch shall be supplied and sized as follows.

XII.1.1.1. Approved manufacturer: Eaton quick-connect double-throw (QCDT) safety switch or approved equal.

XII.1.1.2. ~~The Generator Disconnect Switch shall be sized greater than or equal to the current rating of the Main Circuit Breaker but not larger than 400A.~~ **The Manual Transfer Switch 200 or 400 amps shall be equal to or greater than current rating of the main breaker.**

XII.1.1.3. The generator disconnect manual transfer switch shall not be required, ONLY if a generator set is installed on site. Contact grid coordinator.

XIII. PRECAST CONCRETE AND **POYLMER CONCRETE** WET WELLS

XIII.1. PRECAST CONCRETE MATERIALS:

Wet well bases, sections and miscellaneous structures shall conform to the requirements of ASTM C478 (specification for precast concrete manhole sections and structures) except as modified herein. Cement shall meet the requirements of ASTM C150 (specification for Portland cement, type II). Concrete shall meet the minimum requirements for Class "A" as specified in JEA Water and Wastewater Standards Chapter II. 5. - Section 437- Concrete Work. Minimum wall thickness shall be 1/12 the inside diameter in inches plus 1 inch. Rings shall be custom-made with openings to meet indicated pipe alignment conditions and invert elevations. The Contractor shall submit shop drawings consisting of manufacturer's standard details of various sections, for approval, before placing order for structures.

XIII.2. **POLYMER CONCRETE MATERIALS:**

Wet well bases, sections and miscellaneous structures shall conform to the requirements of JEA Specification Chapter IV. 1. - Section 427 shall be custom-made with openings to meet indicated pipe alignment conditions and invert elevations. The Contractor shall submit shop drawings consisting of manufacturer's standard details of various sections, for approval, before placing order for structures.

XIII.3. BASES:

Bases for wet wells shall be cast integrally with the bottom section. The base section shall be set in a 12-inch (minimum) leveling course of granular material (57 stone) as shown on the drawings. For concrete base and riser's the ~~reinforcing steel~~ **reinforcement** shall be designed, signed and sealed by a Florida Registered Structural Engineer and shall be submitted with the shop drawings.

XIII.3.1. EXTERIOR JOINT SEALANT MEMBRANE, TAPE:

General:

All exterior joints of ~~precast concrete~~ wet well shall be sealed with a 12-inch wide (minimum) exterior joint sealant membrane tape.

Manufacturer:

All exterior joints of ~~precast concrete~~ wet wells shall be sealed with one 18 inch wide **(minimum)** exterior joint sealant membrane centered on joint. The tape shall

be capable of sealing joints against groundwater infiltration. The installation of the membrane shall be in conformance with the recommendations of the manufacturer. Surface must be smooth, clean, dry and free of voids, loose aggregate, dirt or other matter that will hinder the adhesion of the membrane. A primer shall be used in accordance with the recommendations of the membrane manufacturer. If recommended by the manufacturer, heat shall be applied to all areas being sealed. The membrane shall be the type listed in the JEA Water and Wastewater Approved Materials Manual (See AS-501, but utilize 12 inch wide tape).

XIII.4. CORROSION PROTECTION PRECAST CONCRETE:

1. Precast concrete wet well interior shall be lined as specified in JEA Water and Wastewater Standards Chapter IV. 6. - Section 446 Specialty Coatings and Linings. The exterior of the wet well (below grade), shall be given two coats of bituminous water proofing materials which meets the coating requirements as specified for sewage manholes (Specification Chapter IV. 1. - Section 427).

XIII.5. CORROSION PROTECTION POLYMER CONCRETE:

Precast polymer concrete wet well shall be utilized to provide corrosion protection.

XIII.6. PRECAST CONCRETE MANHOLES POLYMER CONCRETE MANHOLES

~~2. The precast polymer concrete junction manholes (nearest wet well) and all precast polymer concrete manholes receiving force mains shall conform to the JEA Water and Wastewater Standards Chapter IV. 1. - Section 427-Manholes and shall be lined as specified in JEA Water and Wastewater Standards Chapter IV. 6. - Section 446 Specialty Coatings and Linings. Junction manholes for pump stations shall be 5 feet inside diameter minimum.~~

XIV. IN-LINE BOOSTER WASTEWATER PUMPING STATIONS - SECTION 435

XIV.1. CRITERIA FOR AN IN-LINE BOOSTER WASTEWATER PUMPING STATION:

Pump Station Type	Pump Station Maximum Peak Flow (GPM)	Emergency Operating System Required	Additional Design Requirements
Class Two	441 - 1000 GPM	Generator or Pump Engine	Flow meter and Smart meter

Class Three	1001—2000 GPM	Generator and 2 Pump Engines	Flow meter and Smart meter Electric power, controls, building with ventilation.
Class Four	2001 GPM and Above	Generator and 2 Pump Engines	Flow meter and Smart meter Electric power, controls, building with ventilation.

III.5.1. The use of an in-line booster wastewater pumping station is intended to serve areas within the sewer collection systems that have a large basin area and long force mains. Criteria for the selection of an in-line booster station includes a location where all flow is pumped to the site, no influent gravity flow, no system storage available, and a minimum pumping capacity of 2001 441-gpm. JEA will have the final approval on the use of and in-line booster station.

XIV.2. DRY PIT PUMPS

XIV.3. OPERATING CONDITIONS AND UNIT SIZES:

Operating conditions and unit sizes shall be as shown on the drawings. Pump shut-off head shall be a minimum of 15% greater than the pump design head for the "all pumps on" condition, such that a pump with a design point of 500-GPM at 100-FT-TDH must provide a shut-off head greater than 115-FT-TDH. The pump design operating conditions shall be within 10% +/- of the best efficiency point, unless otherwise approved by JEA. JEA will provide collection system pressure information to aid in the design and selection of the pumps.

XIV.4. PUMP STATION ELECTRICAL REFER TO SECTION - 433

XV. EMERGENCY GENERATOR (LESS THAN 600 KW) – SECTION 472

XV.1. CHAPTER REVISED:

Shared Services Generator Specifications.
 Refer to https://www.jea.com/Engineering_and_Construction/Facilities/
 Contact information for the Project Administrator:
 Byrd, Benjamin J. byrdbj@jea.com
 Office: 904-510-6966

XVI. AS-BUILT DRAWINGS – SECTION 501 (REWRITE)**XVII. HORIZONTAL DIRECTIONAL DRILLING – SECTION 750 (SMALL DIAMETER PIPE 12 INCHES OR LESS)****XVII.1. SWABBING**

The purpose of swabbing a new pipeline is to conserve water while thoroughly cleaning the pipeline of all foreign material, sand, gravel, construction debris and other items not found in a properly cleaned system. Prior to pressure testing of a new pipeline swabbing shall be utilized ~~as specified on the construction plans~~ for each project. Swabbing details, Chapter VIII, Plates W-45, W-45A, W-45B, W-45C and W-45D.

XVIII. HORIZONTAL DIRECTIONAL DRILLING – SECTION 755 (LARGE DIAMETER PIPE GREATER THAN 12 INCHES)**XVIII.1. SWABBING**

The purpose of swabbing a new pipeline is to conserve water while thoroughly cleaning the pipeline of all foreign material, sand, gravel, construction debris and other items not found in a properly cleaned system. Prior to pressure testing of a new pipeline swabbing shall be utilized ~~as specified on the construction plans~~ for each project. Swabbing details, Chapter VIII, Plates W-45, W-45A, W-45B, W-45C and W-45D.

XIX. MEASUREMENT AND PAYMENT – SECTION 801

XIX.1.1. ~~Installation of silt fence and other erosion, sedimentation protection and control devices.~~

XIX.2. TEMPORARY SAMPLE TAPS:

XIX.2.1. The quantity to be paid will be the actual number of each size and type of sample tap installed and removed. A sample tap utilizing alternative methods (type) will include a sample tap utilizing a new 1 inch water service or a plug at flushing location (see W-24 ~~and W-24A~~ details). There shall be no payment made for temporary sample taps utilizing alternative methods unless this item is specifically listed on the bid form. The cost of a temporary sample tap utilizing alternative methods shall be included in the unit price of the piping. Payment for a temporary sample tap as shown on Detail W-25 or W-26 will be made at the Contract Unit Price and shall be full compensation for the item of work including furnishing and installing, complete, all necessary piping; service saddle; corporation stop; plug; bushings; bends; tees; smooth hose, hose ~~bib~~; ~~gate valve~~, furnishing all material, labor, tools and equipment and all incidental and related work required to complete the item.

XX. WATER AND RECALIMED CONSTRUCTION DETAILS

XX.1.1. W-9 added note stating the reducer only required if approved by a JEA representative

- XX.1.2. W-10 added note 7 (see section 350. III.4.10 for minimum separation requirements from pipe to structures)
- XX.1.3. Added locate wire shall have enough slack to reach 4' above final grade,(locate plates
- XX.1.4. Added waterproof wire connector detail
- XX.1.5. W-20 Removed Span from the table and note #6.

XXI. WASTERWATER CONSTRUCTION DETALS

- XXI.1.1. S-1 Added the extra pick holes to the manhole lid detail
- XXI.1.2. Added Polymer concrete details for each type of manhole
- XXI.1.3. S-21, title block Maximum Allowable Bending Radius changed to Minimum Allowable Bending Radius.
- XXI.1.4. S-26, added note 7 (see section 429. III.4.2 for minimum separation requirements from pipe to structures)
- XXI.1.5. S-50, added stub for future use.
- XXI.1.6. S-50, update note 1 to 20 houses and note 8 to include the service laterals
- XXI.1.7. Locate wire shall have enough slack to reach 4' above final grade
- XXI.1.8. Added waterproof wire connector detail
- XXI.1.9. S-15A buoyancy table
- XXI.1.10. S-28 removed span column from the table and note #6 from

XXII. WATER & RECLAIMED APPROVED MATERIALS (UPDATED CORRECTED MANUFACTUERS)**XXIII. WASTEWATER APPROVED MATERIALS (UPDATED CORRECTED MANUFACTURERS)**

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