WASTEWATER MANHOLES – SECTION 427

I. GENERAL

I.1. SCOPE OF WORK:

The work under this section shall include all labor, material and equipment necessary for the construction and installation of all new wastewater manholes and the removal of existing wastewater manholes as called for on the drawings. All references to Industry Standards (ASTM, ANSI, AWWA, etc.) shall be to the latest revision unless otherwise stated. Only those materials included in the JEA Water and Wastewater Standards Manual shall be installed. All materials shall be new unless specifically called for otherwise.

I.2. PROJECT SCHEDULE AND COOPERATION:

The project schedule shall be established on the basis of working a normal work schedule including five days per week, single shift, eight hours per day or four days per week, single shift, ten hours per day. Unless approved otherwise by JEA, normal or general items of work, such as T-V inspections, density testing and final inspections, shall be scheduled during the normal work schedule. Due to operational and manpower limitation on the JEA systems, JEA will require the contractor to perform work outside the normal work schedule. These operational and manpower limitations, including but not limited to tie-in work (cut-in work or other tie-in work) and other phases of the work which may impact the continued (non-interruptible) service to existing JEA customers. The contractor shall plan and anticipate the cost impact of these system limitations and provide such work or services at no additional cost to JEA.

I.3. SHOP DRAWING SUBMITTALS:

Actual catalog data, brochures and descriptive literature will not be required for items of standard usage which meet the requirements of Chapter X. and Chapter XI. of the JEA Water and Wastewater Standards Manual. Any specialty item not shown in this manual will require a complete shop drawing submittal. The Engineer may at any time require the Contractor to provide a complete detailed shop drawing submittal for any material which, in the Engineer's opinion, may not be in compliance with the JEA Water and Wastewater Standards. The Contractor shall submit shop drawings consisting of individual manholes showing invert elevations, pipe sizes and similar details for approval before placing order for wastewater manholes.

I.4. AS-BUILT DRAWINGS:

As-built drawings to be utilized in future utility locate work are required on <u>all</u> water, wastewater, force main, pump station and reclaimed water 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 specifications Chapter VI. 1. - Section 501, entitled “As-built Drawings”. 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.

I.5. CONTRACTOR WARRANTY:

The Contractor shall supply to JEA a two (2) year unconditional warranty. 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.

I.6. MANHOLE INSPECTION CHECKLIST:

Contractor shall schedule a final walk through (prior to substantial completion) in order to create a punch list for each project. List of attendees shall include but not be limited to the Contractor's representative, JEA representative (ie. project inspector), and designated JEA Operation personnel. Contractor shall be required to provide a crew complete with all necessary equipment to allow observation of each new and rehabilitated manhole interior. The Contractor's representative shall complete the JEA Final Inspection Checklist for each new or rehabilitated manhole structure, and have the JEA attendees provide original signatures/names on the signature block. The JEA representative shall scan the checklists and ensure the documents are filed in the electronic file folder for the project.

II. MATERIALS:

II.1. 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).

II.1.1. Bases:

Bases for concrete manholes shall be cast integrally with the bottom manhole section.

II.1.2. Joints:

Joints shall be tongue and groove configuration formed with machined castings. Joint surfaces shall be as detailed on JEA Standard Details. The joint shall be sealed using an approved pre-molded plastic joint sealer. Prior to placement of the joint sealer the joint surfaces shall be primed in accordance with the recommendations of the sealer manufacturer. Joints shall be water tight. Upon completion of installation, excess joint sealers shall be trimmed flush with the inside and outside surface of the manhole.

II.1.3. Exterior Joint Sealant Membrane:

All exterior joints below the top cone section of precast concrete manholes (including base and risers sections) shall be sealed with one 6-inch wide (minimum) exterior joint sealant membrane centered on joint. The tape shall be capable of sealing manhole joints against groundwater and sand 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. See Approved Materials Manual for a list of approved tape manufacturers.

II.1.4. Coating:

The interior and exterior surfaces of each concrete manhole, including adjusting rings, shall be given 2 coats of bitumastic coating. Total minimum dry film thickness shall be 12 mils. Each coat shall be applied at a rate not to exceed one gallon per 100 square feet. In lieu of a bitumastic coating, an acrylic polymer base coating may be applied on all areas listed above. Three coats of acrylic polymer base coating shall be used with a total dry film thickness of 3.5 mils. The waterproofing materials shall be applied by brush or spray and in accordance with the instructions of the manufacturer. Time shall be allowed between coats to permit sufficient drying so that the application of the additional coat has no effect on the previous coat. Field applications of coatings for precast structures are not acceptable, but are acceptable for applicable field repairs only. All junction manholes (manhole located closest to wet well/PS), manholes which include a 24" or larger pipe and manholes receiving a force main shall be coated internally as outlined in Chapter IV. 6. - Section 446-Specialty Coatings and Linings instead of the interior bitumastic coating. The exterior of all manholes shall receive the bitumastic coating as specified above.

II.1.5. PVC Sand Sleeve:

The PVC sleeve shall have the same SDR rating as the connecting pipe (SDR-26 at a minimum). The outside surface shall have a rough building sand finish. No internal pipe stop is required. A minimum of one internal rubber gasket is required.

II.1.6. Flexible Manhole Connector (Rubber Boot):

As an alternate method of connecting the wastewater pipe to the precast concrete manhole, a flexible pipe to manhole connector may be used. The connector shall be the sole element to assure a flexible watertight seal of the pipe to the manhole.

II.2. FIBERGLASS WASTEWATER MANHOLES:

II.2.1. General:

Fiberglass reinforced polyester manhole shall be manufactured from commercial grade unsaturated polyester resin with fiberglass reinforcements. Manhole shall be a one piece unit manufactured to meet or exceed all specifications of ASTM D3753. Fiberglass manhole shall be designed for H-20, traffic applications (withstand 40,000 lb wheel load) at a minimum.

II.2.2. Manufacture Criteria:

II.2.2.1. Resin:

The resins used shall be a commercial grade unsaturated polyester resin.

II.2.2.2. Reinforcing Materials:

The reinforcing materials shall be commercial Grade "E" type glass in the form of mat, continuous roving, and chop roving, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin.

II.2.2.3. Interior Surfacing Material:

The inner surface exposed to the chemical environment shall be a resin-rich layer of 0.010 to 0.020 inches thick. The inner surface layer exposed to the corrosive environment shall be followed with a minimum of two passes of chopped roving of minimum length 0.5 inches (13 mm) to maximum length of 2.0 inches (50.8 mm) and shall be applied uniformly to an equivalent weight of 3 oz/ft^2. Each pass of chopped roving shall be well-rolled prior to the application of additional reinforcement. The combined thickness of the inner surface and interior layer shall not be less than 0.10 inches (2.5 mm).

II.2.2.4. Wall Construction Procedure:

After the inner layer has been applied, the manhole wall shall be constructed with a chop and continuous strand filament wound manufacturing process which insures continuous reinforcement and uniform strength and composition. The cone section, if produced separately, shall be affixed to the barrel section at the factory with a resin-glass reinforced joint resulting in a one piece unit. Seams shall be fiberglass on the inside and the outside using the same glass-resin jointing procedure. Field joints shall not be acceptable.

II.2.2.5. Exterior Surface:

For a UV inhibitor the resin on the exterior surface of the manhole shall have gray pigment added for a minimum thickness .125 inches. The exterior surface shall be relatively smooth with no sharp projections. Hand-work finish is acceptable if enough resin is present to eliminate fiber show. The exterior surface shall be free of blisters larger than 0.5 inches in diameter, delaminating or fiber show.

II.2.2.6. Interior Surface:

The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delaminating, blisters larger than 0.5 inches in diameter and wrinkles of 0.125 inches or greater in depth. Surface pits shall be permitted if they are less than 0.75 inches in diameter and less than 0.0625 inches deep. Voids that cannot be broken with finger pressure and that are entirely below the resin surface shall be permitted if they are less than 0.5 inches in diameter and less than 0.0625 inches thick.

II.2.2.7. Stub-Outs And Connections:

Stub-outs must be installed per manufacturer's instruction. Installation of smooth exterior PVC wastewater pipe must be performed by sanding, priming, and using resin fiber-reinforced hand lay-up. The resin and fiberglass shall be the same type and grade as used in the fabrication of the fiberglass manhole. Special fittings or boots may be installed by manhole manufacturer.

II.2.2.8. Manhole Bottom:

When indicated on the drawings, manholes shall have resin fiber-reinforced bottoms. Bottom shall have a minimum of three 1½ inch deep x 3½ inch wide stiffening ribs completely enclosed with resin

fiber-reinforcement and have a minimum of 3 inch anti-flotation ring. Manhole bottom shall be a minimum of 5/16 inches thick.

II.2.2.9. Fillers And Additives:

Fillers, when used, shall be inert to the environment and manhole construction. Sand shall not be accepted as an approved filler. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used to meet the requirements of this standard. The resulting reinforced-plastic material must meet the requirements of this specification.

II.2.3. Design Properties:

II.2.3.1. Interior Access:

All manholes shall be designed so that a ladder or step system can be supported by the installed manhole.

II.2.3.2. Manway Reducer:

Manway reducers will be concentric with respect to the larger portion of the manhole diameters through 60 inches. Larger manholes may have concentric or eccentric manway reducer openings.

II.2.3.3. Cover And Ring Support:

The manhole shall provide an area from which a typical ring and cover plate can be supported without damage to the manhole (32 inch opening).

II.2.3.4. Manhole Lengths:

Manhole lengths shall be in 6 inch increments +/- 2 inches.

II.2.3.5. Diameter Tolerance:

Tolerance of inside diameter shall be +/- 1% of required manhole diameter.

II.2.4. Physical Requirements:

II.2.4.1. Physical Properties:

	Hoop Direction	Axial Direction
a. Tensile Strength (psi)	18,000	5,000
b. Tensile Modules (psi)	0.6×10^6	0.7×10^6
c. Flexural Strength (psi)	26,000	4,500
d. Flexural Modules (psi)	1.4×10^6	0.7×10^6
e. Compressive (psi)	18,000	12,000

II.2.4.2. Load Rating:

The complete manhole shall have a minimum dynamic-load rating of 16,000 lbs. When tested in accordance with ASTM D3753 8.4 (note 1). To establish this rating the complete manhole shall not leak, crack or suffer other damage when load tested to 40,000 lbs and shall not deflect vertically downward more than 0.25 inch at the point of load application when loaded to 24,000 lb.

II.2.4.3. Stiffness:

The manhole cylinder shall have the minimum pipe-stiffness values shown in the table below when tested in accordance with ASTM D3753 8.5 (note 1).

MANHOLE LENGTH IN FEET	PSI
3 – 6.5	0.75
7 – 12.5	1.26
13 – 20.5	2.01
21 – 25.5	3.02
26 – 35	5.24

II.2.4.4. Soundness:

In order to determine soundness, apply an air or water pressure test to the manhole test sample. Test pressure shall not be less than 3 psig or greater than 5 psig. While holding at the established pressure, inspect the entire manhole for leaks. Any leakage through the laminate is cause for failure of the test. Refer to ASTM D3753 8.6.

II.2.4.5. Chemical Resistance:

When tested in accordance with ASTM D3753 8.7 the log of percent retention of each property after immersion testing when plotted against the log of immersion time, and extrapolated to 100,000 hours, shall assure retention of at least 50% of initial properties.

II.2.4.6. Required Thickness For Buried Manholes:

Assumptions: Hoop Modulus = 4,000,000 psi
Soil Modulus = 1000 psi (minimum)

Diameter (Inches)	Wet Soil Depth (max) (Feet)	Minimum Thickness (Inches)
48	10	.25
	20	.3125
	30	.375
60	10	.375
	20	.4375
	30	.5
72	10	.4375
	20	.5
	30	.5625
96	10	.5625
	20	.625
	30	.75

II.2.4.7. Test Methods:

All tests shall be performed as specified in ASTM D3753 Section 8. Test method D-790 (see note 5) and test method D-695.

II.2.4.8. Certification:

As a basis of acceptance, the manufacturer shall provide an independent certification which consists of a copy of the manufacturer's test report and a copy of the test results that the manhole has been sampled, tested and inspected in accordance with the provision of this specification and meets all requirements.

II.2.4.9. Marking And Identification:

Each manhole shall be marked on the inside and outside with the following information:

II.2.4.9.1. Manufacturer's Name or Trademark
II.2.4.9.2. Manufacturer's Factory Location
II.2.4.9.3. Manufacturer's Serial Number
II.2.4.9.4. Total Length

II.2.5. Acceptable:

II.2.5.1. L.F. Manufacturing, Inc.
II.2.5.2. Containment Solutions, Inc. (Flowtite Fiberglass Manhole)
II.2.5.3. Associated Fiberglass Enterprises
II.2.5.4. JEA Approved Equal

II.3. CAST IRON WASTEWATER MANHOLE FRAME AND COVER:

Cast iron wastewater manhole frame and cover shall be of the type as shown in JEA Standard Details and as listed within JEA Approved Materials Manual. Manhole cover shall be 32 inches in diameter. Castings shall be even grained cast iron and shall be smooth, free

from scale, lumps, blisters, sandholes and defects of any nature which would render them unfit for the service for which they are intended. They shall be thoroughly cleaned. Castings shall meet the requirements of ASTM A48, "Specifications for Gray Iron Castings, Class No. 30, or Grade 65-45-12" and Ductile Iron meeting the requirements of ASTM A536, "Standard Specification for Ductile Iron Castings". In either case, manhole frame and cover shall be designed to withstand an HS20-44 loading defined in the AASHTO Specifications. Frames and covers shall be machined or ground at touching surfaces so as to seat firmly and prevent rocking. Any set not matching perfectly shall be removed and replaced at no additional cost. A neoprene gasket shall be an integral part of the cover to provide a water tight seal. Cover shall set flush with rim of frame and shall have no larger than an 1/8 inch gap between frame and cover.

II.4. ADJUSTMENT RINGS (MANHOLE COLLARS):

Adjustment rings shall be 8" wide (48" OD X 32" diameter opening) concrete. Concrete adjustment rings shall be 4000 psi (minimum) concrete, Type II cement. Minimum height of rings shall be 2 inches. Rings shall be grouted in place. Concrete mortar (1/2" thick) shall be applied to the interior and exterior surfaces of the concrete adjustment rings. The interior of the concrete ring shall be coated as specified above. In lieu of precast concrete rings, bricks may also be utilized (mortar in place) with 1/2 inch thick mortar layer on interior and exterior surfaces. High Density polyethylene (HDPE) rings may be utilized for manholes located in non-traffic areas only (not in streets, parking areas, drive ways etc.). HDPE adjustment rings shall be stackable and have a minimum height of 2 inches and be installed with silicone sealant as per the manufacturer's directions. Apply heavy amount (covering the entire joining surfaces) of silicone sealant between the manhole cone section and HDPE rings, between all stackable rings and between HDPE ring and manhole frame (note: do not use concrete grout during the assembly of HDPE rings). During the installation of HDPE rings, the contractor shall apply downward pressure on the rings to squeeze out the excess silicone (tight fit).

III. INSTALLATION

III.1. PRECAST CONCRETE WASTEWATER MANHOLES:

III.1.1. 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.

III.1.2. Installing Manhole Sections:

III.1.2.1. 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.

III.1.2.2. The manhole sections shall be set so the manhole will be vertical and with section in true alignment. Construction shall include:

III.1.2.2.1. Cleaning all joint surfaces (remove all sand, oil, debris & other foreign items) and provide additional primer if recommended by the joint manufacturer.

III.1.2.2.2. 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).

III.1.2.2.3. 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).

III.1.2.2.4. 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.

III.1.2.3. 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.

III.1.2.4. 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.

III.1.2.5. 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, a non-shrink grout (not regular concrete) coated with 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.

III.1.3. 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 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 mortar shall be finished smooth and flush with the adjoining interior and exterior manhole wall surfaces. Provide interior and exterior coating as specified above.

III.1.4. Grade Adjustment:

For grade adjustment in setting the manhole frame concrete adjustment rings shall be used on top of manhole slabs and precast concrete manhole cones in accordance with the drawings.

III.1.5. Setting Wastewater Manhole Frames:

Wastewater manhole frames and covers shall be set to conform accurately to the finished ground or pavement surface as established by the Contract Drawings, unless otherwise directed by the Engineer. Frames on manhole cones shall be set concentric with the masonry and in a full bed of mortar so that the space between the top of the manhole and the bottom flanges of the frame shall be completely filled and made water tight. A ring of mortar at least 1 inch thick and pitched to shed water away from the frame shall be placed around the outside of the bottom flange. Mortar shall extend to the outer edge of the concrete adjustment rings and shall be finished smooth and flush with the top of the flange.

III.1.6. The neoprene gasket (T-Gasket seal on the underside of the manhole cover) on the new JEA manhole covers shall be protected from damage during the construction period. Should the gasket be damaged, it shall be repaired by the contractor in accordance with the cover manufacturer's recommendation. The condition of all neoprene gaskets shall be inspected for damage during the final inspection of the project. Damaged gaskets/covers will not be accepted by JEA.

III.2. FIBERGLASS WASTEWATER MANHOLES:

III.2.1. General:

Installation shall be in accordance with the JEA Standards, Details, and Materials Manual and manufacturer's recommendations.

III.2.2. Shipping And Handling:

The fiberglass wastewater manhole shall not be dropped or impacted. Fiberglass wastewater manhole may be lifted by inserting a 4" x 4" x 30" timber into the top of the manhole with cable attached or by a sling or "choker" connection around center of manhole. Use of chains or cables in contact with the manhole surface is prohibited.

III.2.3. Backfill:

III.2.3.1. Backfill Material:

Unless shown otherwise on drawings and approved by the Engineer, sand, crushed stone, or pea gravel shall be used for backfill around the manhole for a minimum distance of one foot from the outside surface and extending from the bottom of the excavation to the top of the reducer section. Suitable material chosen from the excavation may be used for the remainder of the backfill. The material chosen shall be free of large lumps or clods, which will not readily break down under compaction. This material will be subject to approval by the Engineer.

III.2.3.2. Backfill Procedure:

Backfill shall be placed in layers of not more than 12 loose inches and mechanically tamped to 95% Standard Proctor Density, unless otherwise approved by the Engineer. Flooding will not be permitted. Backfill shall be placed in such a manner as to prevent any wedging action against the fiberglass manhole structure.

III.2.4. Concrete:

III.2.4.1. Fiberglass Bottom:

Concrete may be used to form bench area and invert. Concrete may also be used on top of anti-flotation ring and around reducer section as required for buoyancy.

III.2.4.2. Concrete Bottom:

Lower manhole into wet concrete until it rests at the proper elevation, with a minimum of 4 inches of fiberglass manhole inserted into the wet concrete below flow line, then move manhole to plumb. The concrete shall extend a minimum of one foot from the outside wall of the manhole and a minimum of 6 inches above incoming lines. On the inside, concrete shall form the bench and invert area and rise a minimum of 4 inches above incoming lines. If required by Engineer, concrete may be used around reducer section for buoyancy.

III.2.4.3. Repairs:

Any manhole repair is required to meet all requirements of this specification.

III.3. 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.

III.4. DROP INLETS:

Where shown on the drawings, drop inlets to the manhole shall be constructed as shown on the JEA Standard Details and specified herein.

III.5. CONNECTIONS TO EXISTING STRUCTURES:

III.5.1. Opening:

The Contractor shall core suitable openings using a coring machine, jigsaw or hole saw into the existing structure or remove the existing pipe to accommodate the pipelines as indicated on the Contract Drawings and as specified. The portion of each existing structure removed for new installation shall be confined to the smallest opening possible, consistent with the work to be done. Fiberglass manholes shall have the cut out in the wall equal to the outside diameter of pipe, plus ½ inch maximum. The connection to existing manhole shall comply with wastewater detail S-15.

III.5.2. Repair – Concrete Structures:

After the pipe is installed the Contractor shall carefully close up the openings around the pipe, using non-shrink mortar and repair the existing structure invert, if necessary, in a manner satisfactory to the Engineer. If the existing structure has a specialty coating, repair that coating using coating manufacturer's product and installation requirements. See Chapter IV. 6. - Section 446 - "Specialty Coatings and Linings".

III.5.3. Repair – Fiberglass Structures:

Grind the outside surface of the pipe and both the inside and the outside surfaces of the cutout in the structure wall. Apply a priming agent to any PVC pipe that might be used before fiberglass lay-up. Insert the pipe through the cutout in the wall. Apply fiberglass putty to the inside and the outside of the wall cutout, filling openings between pipe and cutout. Make a good radius for the fiberglass lay-up. After the putty has set up, fiberglass the pipe into place. Use one layer of woven roving sandwiched between two layers of fiberglass mat. Allow fiberglass to completely set up before backfilling. Manufacturer of structure shall be responsible for integrity of field glassing.

IV. MANHOLE INSPECTION:

All manholes shall be inspected for leaks and any defects that may cause infiltration, or weaken the structural integrity. Before the final inspection, manholes shall be trimmed of any excess Ram-Nek joint sealant. Any voids in pre-cast manhole shall be filled with non-shrink grout and the grouted areas shall be thoroughly field coated (2 coats) with bituminous waterproofing excluding invert and bench, as required. The gasket on the manhole cover shall be inspected for cuts, tears, scraps and proper fit. If found damaged, the entire gasket seal shall be replaced in accordance with the manufacturer's recommendation, at contractors expense.

Contractor shall be required to televise the interior of each new and/or replacement manhole utilizing a pole mounted type camera. Televising of the manhole structures to occur when gravity wastewater mains are CCTV'd, and in the presence of JEA representative. Results shall be observed by the JEA representative on the CCTV color monitor used for viewing the associated wastewater main. Interior manhole structure to be televised shall be free of debris prior to inspection. Each manhole shall be identified on the DVD and report (both to be copied and delivered to JEA for review and its files) by manhole number and nearest address/intersection or by as-built station number/offset. Manhole to be televised shall require review of frame, cone, risers, joints, bench, flow channel, and each pipe connection.

V. WASTEWATER MANHOLE ABANDONMENT AND REMOVAL

V.1. WASTEWATER MANHOLE ABANDONMENT:

Wastewater manhole abandonment shall be in accordance with Chapter II. 2. - Section 407, 'Demolition and Abandonment'.

V.2. WASTEWATER MANHOLE REMOVAL:

Removal of existing manholes shall include the complete removal of said manholes where so noted on the contract drawings.

V.2.1. Removal Only:

Where no new structure is designated to replace the removed manhole, the void, left by the manhole removal shall be filled and compacted in accordance with Chapter II. 3. -Section 408- Excavation and Earthwork.

V.2.2. Remove And Construct:

Where a new structure is designated to replace an existing manhole, complete removal of the existing manhole shall be achieved so as to permit the construction of a new manhole at approximately the same location.

V.2.3. Disposal Of Structure:

The existing manhole to be removed shall be removed from the site. The rubble shall be disposed of without damage to any of the new or existing facilities at the site. The debris shall be hauled to a disposal site to be designated or approved by the Engineer.

WASTEWATER MANHOLES

JEA Final Inspection Checklist

Project Name: _____

Street/Intersection/Address Location: _____

STA: _____ Offset: _____

Check the following as applicable:

Frame:	☐	At finished grade/below finish grade--adjust per spec
Manhole cover:	☐	JEA logo w/ neoprene gasket
	☐	Not JEA logo w/ neoprene gasket - Provide lid per spec
Manhole cover(gap between frame and cover):	☐	Range of gap no larger than 1/8 inch
	☐	Range of gap larger than 1/8 inch - Provide lid per spec.
Frame condition:	☐	Good
	☐	Cracked/broken--provide replacement
	☐	Offset--needs resetting/regrouting
Adjustment rings grouted/sealed in place:	☐	Yes
	☐	No--provide per spec
Wall condition:	☐	Good
	☐	Damaged/cracks/holes/leaking joints--see spec for resolution
2 coats of bituminous waterproofing from frame to base:	☐	Yes
	☐	No, this is lined or fiberglass
	☐	No--provide per spec
Inside drop assembly (JEA Plate S-4)--Stainless steel brackets/bolts located vertically at 4 feet max.:	☐	Yes
	☐	No--provide per detail

Constructed flume formed for Inside drop < 2 feet:	☐	Yes
	☐	No--provide per detail
	☐	N/A
Pipe seal:	☐	Good
	☐	Leaking--remove & replace per spec
Bench condition:	☐	Good, solid bench per tap test
	☐	Cracked/broken--provide repair per spec
	☐	Clean free of debris
Flow channel condition:	☐	Invert formed
	☐	No invert formed/cracks/broken--repair per spec
Flow channel hydraulics:	☐	Good
	☐	Uneven shape/radius/standing water - repair per spec.
	☐	Clean free of debris

Contractor Representative: _____

Signature & Printed Name

JEA Inspector: _____

Signature & Printed Name

JEA O&M representative: _____

Signature & Printed Name

Commissioned this date: _____