**CITY OF BILOXI**

**SPECIAL PROVISION NO. 907-604-1 CODE: (SP)**

**DATE: 06/27/2017**

**SECTION 604 - MANHOLES, INLETS AND CATCH BASINS**

# Subsection 604.02 - Materials

Add the following paragraphs after the last paragraph of Subsection 604.02:

Precast sanitary sewer manholes shall conform to the requirements of ASTM C478 and shall be cast with Kor-N-Seal I boot as manufactured by Fernco or an approved equal for connecting sanitary sewer pipes to manholes. After installation of the pipe, the pipe shall be grouted in place with a non-shrink grout by filling the inside of the boot with grout from inside the manhole.

Prior to installation, two coats of coal tar epoxy shall be applied to the inside of all precast sanitary sewer manhole sections, unless a 100% solids epoxy system is otherwise required. After installation coal tar epoxy shall be reapplied to areas where it has been chipped, marred, etc.

Sanitary sewer manholes shall be furnished with "Ram-Nek" or approved equal gaskets. All joints in the manholes shall be wrapped tightly with Infi-Shield External Gator Wrap or approved equal. The wrap shall be overlapped a minimum of six inches (6”). All sanitary sewer manholes shall be fitted with Infra-Riser (or approved equal) composite adjustment riser ring. The raising of any castings or gratings in manholes (sanitary sewer and drainage) or catch basins shall be accomplished by using either masonry or Infra-Riser (or approved equal) as required in Section 907-613.

Each section shall have not more than two holes for the purpose of handling. These holes shall be plugged with a non-shrink grout immediately after installation and covered with a minimum 9” x 9” patch of “Gator Wrap” or approved equal.

All sanitary sewer manholes that have a sanitary sewer force main entering it, or other manholes as directed by the City Engineer or his authorized representative, shall be lined with a 100% solids epoxy lining. After installation, the epoxy lining shall be reapplied to areas where it has been chipped, marred, etc. prior to final acceptance.

All of the cold joints on boxes, inlets, etc. that are poured in lifts shall be wrapped tightly with a three foot (3') band of geotextile filter fabric. Filter fabric shall be over-lapped three feet (3’). The Contractor shall secure the filter fabric to the box, inlet, etc. to hold it in place throughout the backfilling operation.

Geotextile fabric shall be non-woven, needle punched, and weigh a minimum of eight ounces (8 oz.) per square yard, as manufactured by Terratex Construction Fabrics, “NO8”, or approved equal.

All inlets and boxes deeper than three feet (3’) will require reinforced copolymer polypropylene plastic steps at 12" O.C. conforming to ASTM C478. Reinforced copolymer polypropylene plastic steps shall be built into the walls of precast sanitary sewer manhole sections at 12" O.C. conforming to ASTM C478. Steps in all boxes, inlets and manholes shall be installed in a straight alignment so as to form a continuous ladder. Spacing from top of inlet, manhole, or box shall be no more than two feet (2’) unless approved otherwise by City Engineer or his authorized representative.

Pre-cast storm drain structures shall not be used. All storm drain structures (e.g. inlets, catch basins, manholes, junction boxes, etc.) shall be cast-in-place.

100% Solids Epoxy Materials for rehabilitation of existing manholes, new manholes in which a force main will enter, or any other manhole to be coated (with the 100% Solids Epoxy) as directed by the City Engineer or his authorized representative, shall be in accordance with the Warren Environmental System P301/S301 (WES), COR-GARD® with ½” permacast MS-10,000 mortars, Strong Seal Epoxy Topcoat System, Strong Seal Urethane Coating System SprayWall Urethane (SprayROQ), or approved equal. Strong Seal QSR is approved for patching and MS-2-(A & C) is approved for rehab of structures in a non-corrosive environment only. The material sprayed onto the surface of the manhole shall be a 100% solids, low odor, amine cured epoxy.

“Size II Stabilizer Aggregate” for bedding shall be in accordance with Section 907-304-1, “Granular Courses”.

# Subsection 604.03.2 – Concrete Masonry

Add the following paragraph after the last paragraph in Subsection 604.03.2:

A precast concrete adjusting ring may be used on precast concrete manholes upon approval of the City Engineer or his authorized representative. The adjusting ring shall be set on a one-inch (1”) mortar bed to connect the ring to the manhole. The connection shall be constructed to be smooth, neat, and watertight on the inside and the outside of the manhole.

# Subsection 604.03.5 - Inlet and Outlet Pipes

Add the following paragraphs after the last paragraph in Subsection 604.03.5:

Concrete invert channels shall be poured in all manholes, boxes, inlets, etc. in the field by the Contractor and shall be smooth and accurately shaped to a semi-circular bottom conforming to the inside of the adjacent pipe section. Inverts shall extend up at least half of the diameter of the pipe. Changes in direction of flow of entering branches shall have a true curve of as large a radius as the size of the structure will permit. All flow shall be blocked off during the time that the invert is being worked on. No debris shall be allowed to enter the structure.

Inlet and outlet pipes shall be placed in existing structures by cutting through the walls and reshaping the inverts. The Contractor shall use a non-shrink grout to install a Fernco concrete manhole adapter around the pipes so as to prevent leakage and to refinish the part of the structure worked on.

Where the vertical distance from the flow line of the outgoing sewer to the invert of the incoming sewer in any sanitary sewer manhole exceeds two feet (2'), a drop pipe connection shall be built for the incoming sewers. Drop sizes will be as directed by the City Engineer or his authorized representative.

The Contractor shall stub an eighteen inch (18”) long piece of six inch (6”) diameter perforated SDR-26 pipe through the sidewall of all drainage structures as directed by the City Engineer or his authorized representative. The entire length of the perforated pipe stub-out shall be wrapped in eight ounce (8 oz.) geotextile fabric. The perforated pipe shall be installed in such a manner that silt is prevented from entering the open end of the stub-out and the perforations. The holes in the perforated pipe shall be one-half inch (1/2”) in diameter.

# Subsection 604.03.6 – Castings, Gratings, and Fittings

Add the following paragraphs after the last paragraph in Subsection 604.03.6:

# All castings shall meet AASHTO M306, latest revision.

# Subsection 604.03.8 - Excavation and Backfill

Delete the last sentence of Subsection 604.03.8 and add the following paragraph:

All backfill placed around manholes, inlets, catch basins, junction boxes, conflict boxes, and any other structure shall be placed in 6 to 8 inch (6" to 8") lifts and compacted to 95% density in accordance with ASTM D 1557. The Contractor shall take density tests around all four (4) sides of all structures to assure proper compaction.

Insert the following subsection after subsection 604.03.9, “Cleaning Up”:

**604.03.10 – 100% Solids Epoxy Liner.** 100% Solids Epoxy Liner system shall be applied to manholes as indicated on the drawings or in accordance with this specification and in accordance with the manufacturer’s written instructions. Total final dry film thickness shall be 100-120 mils. Thinning will not be allowed.

The cured epoxy system shall conform to the minimum physical standards, as noted below:

Cured Epoxy Standard Long-Term Data

Tensile Strength ASTM D 638 6300 psi

Flexural Strength ASTM D 790 9000 psi

Abrasion Resistance ASTM D 4060 95 mg

Pot Life 68 minutes @ 77°Fahrenheit

# Subsection 604.04 - Method of Measurement

After the last paragraph of Subsection 604.04, insert the following paragraphs:

“Size II Stabilizer Aggregate” for bedding shall be measured and paid in accordance with Section 907-304-1, “Granular Courses”.

Backfill, filter fabric, “Gator Wrap”, steps, concrete for drop manholes, grout, inverts, and coal tar epoxy liner will not be measured for separate payment. The cost thereof shall be absorbed in the unit prices bid for other items.

The perforated pipe stubbed out of all drainage structures, including geotextile fabric, will not be measured for separate payment. The cost thereof shall be absorbed in the unit price bid for other items.

Sanitary sewer manholes will be measured by the number of units as specified for depth intervals of zero to six foot (0-6'), six to eight foot (6-8’), eight to ten foot (8-10’), and progressing on two-foot intervals. The invert of the lowest inlet pipe to the finished grade at the top of the casting will determine the overall depth of the manhole. This measurement must exceed the higher end of the depth interval by seven inches (7") for the manhole to be counted in the next incremental depth category.

100% Solids Epoxy Liner System shall be measured by square feet for which the system is applied. The cost shall include any corrections or additions.

# Subsection 604.05 - Basis of Payment

Add the following paragraphs after the second paragraph of Subsection 604.05:

Sanitary sewer manholes will be paid for at the contract unit price per each, complete in place. These prices shall be full compensation for completing the work specified.

100% Solids Epoxy Liner System will be paid for at the contract unit price of square feet complete in place. These prices shall be full compensation for completing the work specified.

Following the phrase "Payment will be made under" add the following pay item numbers:

907-604-C: 4' Dia. Precast Concrete Manhole (Depth) - per each

907-604-D: 5' Dia. Precast Concrete Manhole (Depth) - per each

907-604-E: 6’ Dia. Precast Concrete Manhole (Depth) - per each

907-604-F: 100% Solids Epoxy Liner -per square foot