

# Special Specification 7088

## Sanitary Sewer



### 1. DESCRIPTION

Furnish labor, materials, and equipment necessary to adjust and reconstruct manholes in conformance with the plans and specifications, and in compliance with the Department's Utility Accommodations Policy (Title 43, TAC, Sections 21.31-21.55) or as directed.

Reference specifications of the American Society for Testing and Materials (ASTM), American Water Works Association (AWWA) and American National Standards Institute (ANSI) will mean the latest standard in effect on the date of the proposal.

### 2. MATERIALS

All materials must conform to the requirements of this Item, the plans and the following Items:

- Item 421, "Hydraulic Cement Concrete;"
- Item 440, "Reinforcement for Concrete;"
- Item 465, "Junction Boxes, Manholes and Inlets;" and
- Item 471, "Frames, Grates, Rings and Covers."

2.1. **Manholes.** Material for manholes will conform to the requirements of Item 465, "Junction Boxes, Manholes and Inlets," as described below and as shown on the plans.

2.1.1. **Throat Rings.** Adjustment throat rings must be made of either HDPE or reinforced concrete rings having a maximum thickness of 2 in. The internal diameter must match the existing rings unless the cone section is being replaced. If the cone section is replaced, the internal diameter must not be less than 30 in. as required by 30 TAC 217, and the width must be a minimum of 5 in. Concrete must conform to the provisions of Item 421, "Hydraulic Cement Concrete," Class A. If concrete throat rings are to be installed they must be used in conjunction with a UV stabilized polyethylene liner and I/I barrier. I/I barrier must meet the following ASTM standards: ASTM D-790/1505 Density of Polyethylene Materials, ASTM D1238 Melt Flow index, ASTM 638 Tensile Strength @ Yield (50mm/mm), ASTM 790 Flexural Modulus, ASTM 648 Heat Deflection temperature @iegal, ASTM 1693 EsCR, 100% iegal/10% iegal.

2.1.2. **Rings and Covers.** Materials for rings and covers will conform to the requirements of Item 471, "Frames, Grates, Rings and Covers." The rings and covers will be cast iron. Covers are to contain no holes or openings. Provide lifting bars with slots cast into the covers. Rings and covers must have a 30 in. (min.) opening per 30 TAC 217.55 (L) (I) A.

Watertight manhole rings and covers, when designated on the plans, are to be cast iron. Covers are to contain no holes or openings except as required for bolts. Lifting bars with slots adequate for pick insertion and cast into the covers are to be provided for lifting purposes. Covers are required to seat on a minimum 5/16 in. diameter rubber ring gasket conforming to the material requirements of ASTM Designation C-443. The rubber gasket is to rest in a groove cast in the ring. A minimum of four (4), 5/8 in. diameter stainless steel, hex head bolts will be provided for each cover. The four (4) bolt holes in the covers will be evenly spaced and provided with minimum 1 1/2 in. diameter counter sinks for the bolt heads. On the fastened and bolted position the bolt heads will not extend beyond the surface of the cover. Gaskets of a size and material, as approved will be provided for the bolts to insure water tightness. Alignment marks will be cast onto watertight rings and covers for proper bolt alignment.

All finished frames and covers will have the bearing surfaces machine ground and sets of rings and covers will be marked in such a way that they can be matched for assembly in the field. All covers will have the words "Sanitary Sewer" cast thereon or as specified in the details.

- 2.1.3. **Concrete.** All concrete is to meet the requirements of Item 421, "Hydraulic Cement Concrete," Class A.
- 2.1.4. **Reinforcing Steel.** Reinforcing steel and the placing thereof is to conform to the requirements of Item 440, "Reinforcement for Concrete," except where welded wire is called for on the plans, the material will be welded wire flat sheets meeting ASTM. A-185. Welded wire rolls will not be used.
- 2.1.5. **By-Pass Pumping.** The Contractor shall provide and maintain adequate pumping equipment, force mains and other necessary appurtenances in order to maintain reliable sanitary sewer service in all sanitary sewer lines as required for construction. The Contractor shall have backup pump(s), force main(s) and appurtenances ready to deploy immediately. Appurtenances and discharge point shall be approved by the Inspector.

Any spillage, backups and/or overflows, etc. as the result of inadequate equipment are the sole responsibility of the Contractor.

The Contractor shall demonstrate that the pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24 hours prior to beginning the work.

The Contractor shall be required to have all materials, equipment and labor necessary to complete the repair or replacement on the job site prior to isolating the sewer manhole or line segment and beginning by-pass pumping operations.

---

### 3. CONSTRUCTION

#### 3.1 Manholes.

##### 3.1.1 Adjusting Existing Manholes.

Adjust Existing manholes to be in accordance with Item 479, "Adjusting Manholes and Inlets", and as specified herein.

Existing manhole rings and covers which are determined by the SAWS Inspector to be in an unacceptable condition, will be removed and replaced with new rings and covers. If cone section is removed the contractor is to upgrade to a 30" opening as required by 30 TAC 217. Contractor shall take all necessary measures to prevent damage to existing or new rings, cover, or cone from equipment and materials used in or taken through the work area. If an existing or new manhole cover, ring, or cone is damaged by the Contractor, it shall be replaced (as directed by SAWS inspector) by the Contractor at his expense. If concrete throat rings are to be installed they must be used in conjunction with a UV stabilized polyethylene liner and I/I barrier. I/I barrier must meet the following ASTM standards: ASTM D-790/1505 Density of Polyethylene Materials, ASTM D1238 Melt Flow index, ASTM 638 Tensile Strength @ Yield (50mm/mm), ASTM 790 Flexural Modulus, ASTM 648 Heat Deflection temperature @ IGEPAL, ASTM 1693 EsCR, 100% IGEPAL/10% IGEPAL.

Manholes shall be adjusted before placing of the surface course. All manholes shall then be raised a sufficient height so as to be level with the finished surface course. Adjustment in height will be made by addition or removal of "throat rings" above the manhole "cone" where feasible. A minimum of two and a maximum of six throat rings may be used at each adjusted manhole.

## 3.1.2

**Reconstruct Existing Manholes.**

The reconstruction of existing manholes, all types and sizes, will include the replacement of manhole ring and covers, the replacing of existing cone, manhole section or sections required, regardless of the type shown on the plans, and as specified herein.

Manholes will be raised or lowered by replacing the existing cone and manhole sections, as required for installation, to the finished surface. All openings will be protected by hatch covers or steel plates, as needed. Flowable fill shall be used from the base of the manhole to 1 foot below the cone section.

Reconstructed manholes will be cleaned of any debris as accepted by the San Antonio water System's Inspector. If a new manhole cover, ring, or reconstructed manhole is damaged by the Contractor, it will be replaced, as directed by the San Antonio Water System Inspector, by the Contractor, at his expense. Material excavation from around the manholes will be replaced with concrete in accordance with details shown on the plans, and select materials from the excavation.

All reconstructed existing manholes shall be watertight and the interior walls coated with a SAWS approved sewer structural coating. All excess materials of any type will be disposed of by the Contractor at his own expense and at an approved location.

## 3.2

**Traffic Control.** General. Follow procedures for traffic control safety according to Item 502 of the Department's Standard Specifications for Construction of Highways, Streets and Bridges. Contractors should refer to the SAWS Work Zone Traffic Control Program for guidance. All streets and traffic ways shall be kept open for the passage of traffic and pedestrians during the construction period unless otherwise approved. When required to cross, obstruct or temporarily close a street or traffic way, the Contractor shall provide and maintain suitable bridges, detours or other approved temporary expedients for the accommodation of traffic. Closing shall be for the shortest time practical, and passage shall be restored immediately after completion of the work. The Contractor shall give the required advance notice of proposed operations to the fire and police departments and area medical facilities. The Contractor shall give reasonable notice to owners or tenants of private property who may be affected by proposed operations.

The Contractor shall provide signs, signals, barricades, lights and all other equipment, service and personnel required to regulate and protect all traffic and warn of hazards as approved and directed. The Contractor shall remove temporary equipment and facilities when no longer required and restore the area to its original or specified condition. Provide and operate traffic control required to direct and maintain an orderly flow of traffic in all areas under the Contractor's control or affected by the Contractor's operations. Provide traffic control at the following locations: at each change of direction of a roadway and at each crossroad, at detours and hazardous areas, and at parking areas. Traffic Notes and Special Conditions. It is the Contractor's responsibility to insure that all traffic control devices are properly installed and maintained. All locations and distances will be determined in the field, by the Contractor, using the Texas Manual on Uniform Traffic Control Devices. If the traffic control devices do not conform to established standards, or are incorrectly placed or insufficient, the Engineer shall have the authority to stop construction operations until such time as the conditions are corrected. The Contractor shall notify the Engineer then contact the City Traffic and Signalization Departments one week in advance of any street closure. As work progresses, location for traffic control devices will be adjusted and modified by the Contractor, as necessary or directed. Additional traffic control devices, special directional devices, or business name signs (as requested by businesses) may be required at the Contractor's expense. The Contractor shall be responsible for suitable access accommodations for: pedestrians, including school children, delivery of mail by the U.S. Postal Service, and residents and all businesses during all phases of work. At no time shall the Contractor have more than 50-ft. of trench not backfilled or concreted, nor more than two open excavation areas at any one time, unless previously approved. The Contractor shall provide for lane closings and traffic routing such that a minimum of two lanes on one-way streets and one lane each way on two-lane streets is maintained open to traffic at all times. Parking control. Contractor related vehicular parking shall not interfere with public traffic or parking, access by emergency vehicles, other utility operations, or construction operations. Temporary parking facilities for public will be provided by the Contractor as required due to construction operations. Parking of all construction and private vehicles will be monitored by the Contractor. Free vehicular access to and through parking areas will be maintained. Parking will be prohibited in non-designated

areas. Haul Routes. The Contractor shall consult with governing authorities to establish haul routes and site access. Payment for the above traffic control operations will not be paid for separately, but will be considered subsidiary to this Item.

## 3.3

**By-Pass Pumping.** The Contractor shall provide by-pass pumping of sewage and wet weather flows around each segment(s) of pipe that is to be replaced. The Contractor will be required to provide in writing a sequence of by-pass pumping for review and approval by the Inspector. Refer to the construction plans for the construction phasing and diversion requirements. The Contractor shall also provide the Inspector a sketch showing the location of by-pass pumping equipment for each line segment(s) around which flows are being by-passed. The Contractor shall be responsible for all required bulkheads, pumping, equipment, piping, etc., to accomplish the sequence of pumping.

The Contractor shall cease by-pass pumping operations and return flows to the new and/or existing sewer when directed by the Inspector. All piping(s), joints and accessories shall be designed to withstand at least twice the maximum system pressure, or a minimum of 50 psi whichever is greater. During by-pass pumping, no sewage shall be leaked, dumped, or spilled in or onto, any area outside of the existing sanitary sewer system. When by-pass pumping operations are complete, all pumping shall be drained into the sanitary sewer prior to disassembly.

- i. Pump Condition. The Contractor shall demonstrate that the pumping system is in good working order and can successfully handle flows 24 hours a day.
- ii. Pump Operation. The Contractor shall plug off and pump down the sewer manhole and line segment in the immediate work area and shall maintain the sanitary sewer system so that surcharging does not occur. Where work required the line to be locked beyond working hours, the Contractor shall operate the by-pass pump and man the operation 24 hours a day.

The Contractor shall complete the repair, replacement, rehabilitation as quickly as possible, satisfactorily meet all test, and repair all deficiencies as specified prior to discontinuing by-pass pumping operations and returning flow to the sewer manhole or line segment.

The Contractor shall notify the inspector, should a surcharge occur during the rehabilitation process resulting in the overflow of sewage. If the Contractor is unable to regain control of the situation, the rehabilitation operation should be suspended or terminated until such time as the overflows have been controlled. Any damage to the materials, equipment and/or adjacent properties due to such surcharge shall be repaired at the Contractor's expense.

The Contractor shall ensure that no damage will be caused to private property as a result of by-pass pumping operations. Ingress and egress to adjacent properties shall be maintained at all times. Ramps, steel plates or other methods shall be employed by the Contractor to facilitate traffic over surface piping. High traffic commercial properties may require alternate methods.

In the event, that sewage accidentally drains into the storm drainage system or is spilled within the project, the Contractor shall immediately stop overflow, notify the inspector, and take necessary action to clean up and disinfect the spillage using an HTH, or equal, chemical to the satisfaction of the Engineer. If sewage is spilled onto public or private property, the contractor shall wash down, clean up and disinfect the spillage to the satisfaction of the Engineer.

The Contractor shall locate by-pass pumping suction and discharge lines so as to not cause undue interference with the use of streets, private driveways and alleys. In cases where the suction and or discharge lines are required to be buried for vehicle/pedestrian traffic, cost for this work is incidental and includes complete restoration of any surface features disturbed. Force main piping may be laid inside of storm drainage pipes to avoid surface interference with vehicular or pedestrian traffic. Flows shall not be allowed to spill from said force mains into said drainage pipes. The use of existing storm drain systems shall be approved by the Engineer. Force mains laid in storm sewers shall be pressure pipe and fittings.

The Contractor shall not intentionally damage or remove portions of existing storm sewer system structures or sanitary sewer structures for the purpose of installing by-pass pumping system without specific approval from the

Inspector. If a structure is damaged, it shall be reconstructed or replaced to the satisfaction of the Engineer at the Contractor's expense.

The Department shall not be responsible for any damage to the by-pass pumping system sustained by the Contractor directly or indirectly as a result of storm water runoff within streets, ditches and/or storm sewer systems. The Contractor shall be responsible for any and all damage that results directly or indirectly from the interference of storm water runoff to by-pass pumping equipment, piping and/or appurtenances.

It is the intent of these specifications to require the Contractor to establish adequate by-pass pumping as required regardless of the flow conditions.

---

#### 4. MEASUREMENT

- 4.1 **Adjust Manholes.** Manholes adjusted as prescribed herein, will be measured by each manhole. The excavation and backfill required and any Barrier needed for Adjust Manholes will not be measured for payment, but will be considered subsidiary to this Item.
- 4.2 **Reconstruct Manholes.** Manholes completely reconstructed as prescribed herein, will be measured by the unit of each manhole (any type or size), and regardless of the type shown on the plans.
- 4.3 **By-pass Pumping.** This Item will be measured by the "Lump Sum" as the work progresses. No additional measurement or payment will be made for conditions caused by the Contractor during construction.

---

#### 5. PAYMENT

- 5.1 **Adjust Manholes.** Manholes adjusted will be paid for at the unit price bid for "Sanitary Sewer (Adjust Manhole)".
- 5.2 **Reconstruct Manholes.** Payment for reconstructed manholes, complete in place will be made at the unit price bid for "Sanitary Sewer (Reconstruct Manhole)".
- 5.3 **By-Pass Pumping.** The work performed and material furnished in accordance with this Item and measured as provided under "Measurement" will be paid for the unit price bid for "Sanitary Sewer (By-Pass Pumping)". Partial payments of this "Lump Sum" bid will be as follows:

When initial set-up and operation of the by-pass system begins, 40% of the line item will be paid. The remaining portion of the line item will be paid when the by-pass pumping operations for the entire job are completed.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the various unit prices. These prices are full compensation for furnishing materials and for equipment, labor, tools, and incidentals.