

Section 02553

POINT REPAIRS AND OBSTRUCTION REMOVALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Repair of sanitary sewer lines by replacing short lengths of failed pipe with new pipe.
- B. Repair of service lines located within the utility easement or street right-of-way, by replacing short lengths of failed pipe with new pipe.
- C. Obstruction removal by remote device or excavation.

1.02 MEASUREMENT AND PAYMENT

A. Unit Prices:

1. Point Repair:

- a. Measurement for sewer line point repair is on a unit price basis for each point repair performed. The length of pipe to be replaced under each point repair pay item, as determined by depth of sewer line measured from natural ground to flowline at the location of the point of repair, is as follows:
 - (1) Six (6) feet minimum length for sewers up to ten (10) feet deep.
 - (2) Ten (10) feet minimum length for sewers over ten (10) feet deep.
- b. Measurement for sewer line extra length point repair is on a linear foot basis in excess of minimum replacement lengths specified above.
- c. Payment for service line point repair is on a linear foot basis for all sizes of service lines and for all depths (same unit price per linear foot, regardless of size and depth). No separate payment will be made for point repair done within the limits of a service line reconnection as defined in Section 02534 - Sanitary Sewer Service Stubs or Reconnections. Minimum length of service line point repair is 3 feet.
- d. Measurement for hand excavation is on a cubic yard basis when authorized by the Engineer in locations where excavation by machine is not suitable.
- e. Measurement for abandonment of point repair by excavation is on a per each basis for excavation required to expose existing pipe. Separate measurement will be made for machine excavation and hand excavation.

- f. Measurement for abandonment of point repair by video inspection is on a linear foot basis for TV Inspection and Cleaning.
 - g. The cost of the following items of work are included in the unit prices for point repairs:
 - (1) Excavation, embedment and backfill.
 - (2) Hauling away and lawful disposal of excess excavated materials and debris.
 - (3) Pipe, pipe fittings, adapters and concrete collars.
 - (4) Smoke testing and any required testing.
 - (5) Restoration of site improvements, including sodding.
 - (6) Pre- and post-cleaning video inspection.
 - h. Pipe replacement required as part of a new or replacement manhole installation, due to existing deteriorated or inadequate pipe, shall be paid for under the Pipe Replacement Beyond Point Repair pay item appropriate for the size and depth of the sewer. Pipe replacement required due to damage by or for the convenience of the Contractor shall be paid by the Contractor.
 - i. Storm sewer replacement required to properly rehabilitate the sanitary sewer shall be paid under the Pipe Replacement Beyond Point Repair pay item appropriate to the storm sewer size and depth being replaced. Storm sewers greater than 24-inch diameter will be paid under Pipe Replacement Beyond Point Repair 18"-24" pay item at the appropriate depth.
2. Obstruction Removal:
- a. Obstruction removal by excavation will be paid on a unit price basis according to depth for each removal. Obstruction removal can be submitted for payment when the obstruction has been cleared from the sewer line to be lined. Liner work must proceed at least 6 feet before payment for removal of another obstruction will be considered (i.e., all obstruction within a distance of 6 feet is considered to be part of the same obstruction.)
 - b. Depth shall be measured from natural ground level to the flow line at the point of obstruction removal.
 - c. The cost of the following items of work are included in the unit prices for obstruction removal by remote device or excavation:
 - (1) Cleaning of sanitary sewers due to broken pipe, roots, dirt, loose deposits, etc.
 - (2) Television inspection.
 - (3) Excavation, embedment and backfill.
 - (4) Hauling away and lawful disposal of excess excavated material and debris.
 - (5) Restoration of site improvements, including sodding.

- d. Payment will not be made for obstruction removal if the existing sewer line, service line or tap is damaged and a point repair is required. Payment will not be made for removal of a protruding tap if the service reconnection is performed by excavation.
 - e. Removal of hard deposits, concrete, debris, pipes or any other material in a manhole, or that is accessible from the manhole wall, will be cleared under work items for rehabilitation of sanitary sewer pipes and manholes.
3. Refer to Section 01270 - Measurement and Payment for unit price procedures.
- B. Stipulated Price (Lump Sum): If the Contract is a Stipulated Price Contract, payment for work in this Section is included in the total Stipulated Price.

1.03 PERFORMANCE REQUIREMENTS

A. Point Repair:

1. Locate and replace small lengths of one or more pipe sections where isolated line failure has occurred due to settlement, corrosion, crushing, or separation of joints.
2. The Engineer may identify potential locations for point repair, but the Contractor is responsible for verifying locations. Point repairs to sewer lines are listed in Point Repair Rehabilitation Tables. Point repairs to service lines are listed in Lateral Line Rehabilitation Tables.
3. Determine the location of service line repairs by smoke testing the manhole section in which the failed pipe is located. The Engineer will authorize the Contractor to make point repairs based on results of smoke testing.
4. Conduct all smoke testing in accordance with the City of Houston "Procedures to Conduct Physical Inspections of the Wastewater Collection System". Smoke testing shall not be performed within 24 hours of a rainfall event or if ponded or standing water is present on the ground or in the drainage channels in the area planned for smoke testing.
5. Smoke testing shall be accomplished utilizing two (2) minimum 1,750 CFM blowers designed specifically for smoke testing of sewers. Place blower on the upstream and downstream manhole of the line section to be tested. Place sandbags in the upstream and downstream manholes to isolate the section being tested and prevent the migration of smoke into sections not being tested. Utilize smoke bombs as

necessary to ensure a continuous supply of smoke is provided for the entire duration of the test period.

6. Determine the location of point repairs by smoke testing or closed circuit television inspection of the failed pipe location. The Engineer will authorize the Contractor to make point repairs.
 7. The Engineer will authorize each point repair after failure points are located. Do not make point repairs without prior authorization of the Engineer. Perform point repairs only on those portions of service lines which are located in an easement or right-of-way; perform no repairs to service lines on private property.
 8. Replace carrier pipe for point repairs unless otherwise directed by the Engineer.
- B. Obstruction Removal: Remove obstructions by one of the following methods:
1. Obstruction removal by remote device:
 - a. Protruding taps: Service lines that protrude more than one inch into the sewer.
 - b. Other obstructions: Hanging gaskets, fixed debris, stabilized sand, hardened mineral deposits, roots, rust scale, tuberculation, etc.
 2. Obstruction removal by excavation: Obstructions encountered during liner insertion that are removed by digging and exposing the pipe.

1.04 DEFINITIONS

- A. Point Repair: Repair of broken or collapsed gravity sanitary sewer lines on public property, including mains, collectors and service lines, by replacing, at the point of failure, the length of failed pipe with new pipe.
- B. Obstruction Removal: Clearing sewer mains of obstructions to allow for rehabilitation.
- C. Sewer Lines: Gravity flow pipe lines in the easement or right-of-way which collect sanitary sewer discharges from commercial or residential service lines and discharge into another sewer line (main or collector), or into a lift station or treatment plant.
- D. Service Lines: Those gravity flow sewer lines from commercial or residential property that discharge into a sewer line.

1.05 SUBMITTALS

- A. Submittals: Comply with Section 01330 - Submittal Procedures.
- B. Submit product data for each pipe product, fitting and jointing material.

- C. Submit Pre and Post inspection videos in accordance with Documents 02558- Cleaning and Television Inspection.

1.06 SEQUENCING

- A. Before rehabilitating a sewer line section between adjacent manholes, complete point repair and obstruction removal on that section.
- B. Clean the line and perform a post-installation video inspection for each point repair on a sewer line not scheduled for additional rehabilitation.
- C. Post-installation video inspection of the service line point repair is not required.

PART 2 PRODUCTS

2.01 PVC PIPE

- A. PVC Sewer Pipe and Joints: 4-inch through 24-inch pipe complying with Section 02506 - Polyvinyl Chloride Pipe. If point repair is located at a service connection, use a full-bodied fitting for the service connection. No field fabrication of fittings allowed.

2.02 DUCTILE IRON PIPE

- A. Ductile Iron Pipe: 4-inch thorough 48-inch, complying with Section 02501 – Ductile Iron Pipe and Fittings.
- B. Fittings: Push-on end-joint fittings with bell-and-spigot ends, with bells modified for push-on joints, complying with Section 02501 - Ductile Iron Pipe and Fittings.
- C. Interior Coating: Comply with Section 02501 - Ductile Iron Pipe and Fittings.
- D. Exterior coating: 8-mil polyethylene tubular material conforming to requirements of Section 02528 – Polyethylene Wrap.

2.03 REINFORCED CONCRETE PIPE

- A. Reinforced Concrete Pipe and Joints: Comply with Section 02611 - Reinforced Concrete Pipe. Reinforced concrete pipe may be used for sewers 21 inches in diameter and larger.

2.04 FRP PIPE

- A. FRP Pipe: Comply with Section 02504 - Centrifugally Cast Fiberglass Pipe.

2.05 JOINTING MATERIALS

- A. Use flexible adapters secured with 1/2-inch stainless steel bands, as manufactured by Fernco, or approved equal.
- B. Form a concrete collar around each joint using concrete complying with Section 03315 - Concrete for Utility Construction.

PART 3 EXECUTION

3.01 PROTECTION

- A. Provide barricades, warning lights and signs for excavations created by point repairs. Comply with Section 01504 - Temporary Facilities and Controls.
- B. Do not allow soil, sand, debris or runoff to enter sewer system.

3.02 DIVERSION PUMPING

- A. Install and operate diversion pumping equipment as required to maintain sewage flow and to prevent backup or overflow. Comply with Section 01506 - Diversion Pumping.

3.03 EXCAVATION

- A. Excavate and backfill trenches in accordance with Section 02317 - Excavation and Backfill for Utilities.
- B. Perform work in accordance with OSHA standards. Employ a trench safety system as required in Section 02260 - Trench Safety System.
- C. Install and operate necessary dewatering and surface water control measures as required in Section 01578 - Control of Ground Water and Surface Water.
- D. Remove and lawfully dispose of excess excavated material and debris from the work site daily.

3.04 TYPICAL SEQUENCE OF POINT REPAIR

- A. Perform pre-installation video inspection to verify the location of sewer line point repairs. Perform service testing between manholes to verify location of service line point repairs.

- B. After the location of a point repair, excavate the required length for the point repair.
 - C. Prior to replacing pipe, determine condition of the existing line on both sides of the point repair by lamping the line at least 10 feet in each direction. Determine whether additional lengths of line (beyond "minimum length" criteria) need replacement. Report need for additional replacement to the Engineer and obtain authorization before proceeding.
 - D. Remove the damaged pipe and replace with new pipe, shaping the bottom of the trench and placing the required pipe bedding so that the grade of the replaced pipe matches the grade of the existing line. Establish proper grade for the pipe being replaced using methods acceptable to the Engineer.
 - E. Connect the new pipe to existing pipe using flexible adapters. If joints cannot be made watertight using flexible adapters, place waterstop gaskets on each joint and encase in a reinforced concrete collar as indicated on Drawing 02531-04, Sanitary Sewer Pipe Transition for 36" Sewer and Smaller. Place concrete as specified in Section 03315 - Concrete for Utility Construction. Reconnect affected service connections or stacks using full-bodied fittings. No field fabrication of fittings allowed.
 - F. After completion of point repair, but prior to backfill, perform a smoke test to demonstrate the integrity of the repair, in the presence of the Engineer. Test as specified in Section 02533 - Acceptance Testing for Sanitary Sewers. Repair and retest sections that fail until repair passes test.
 - G. Encase exposed pipe in cement stabilized sand complying with Section 02321 - Cement Stabilized Sand.
 - H. Backfill the excavation as specified in Section 02317 - Excavation and Backfill for Utilities.
 - I. Complete site restoration as specified in Section 01740 - Site Restoration.
 - J. Perform a post-installation video inspection as specified in Document 02558 - Cleaning and Television Inspection. Point repairs that show offset joints, non-uniform grade, incorrect alignment, excessive deflection or similar conditions are considered defective work. Replace pipe and bedding as required to correct defective work.
 - K. Extra length of Pipe Replacement beyond the Point Repair limits may be extended to the entire section either way, even to the next continuous section, as directed by the Engineer.
- 3.05 ABANDONMENT OF POINT REPAIR
- A. If a pipe is exposed by excavation and found to be in good condition, not requiring a point repair, that point repair shall be abandoned. Notify the Engineer.

- B. If pre-installation video inspection reveals that no point repair is required, the Contractor shall Notify the Engineer and the point repair shall be abandoned.
- C. Backfill the excavation, replace pavement or sidewalk, and repair and seed or sod unpaved areas, as specified in Section 01740 - Site Restoration.

3.06 OBSTRUCTION REMOVAL

- A. Remote Device: Remove obstructions identified during video inspection of a sanitary sewer line segment which could cause a non-uniform liner pipe installation or obstruction of the liner during installation. Obtain authorization from the Engineer for obstruction removal with a remote device before proceeding.
 - 1. Use a power-driven cutting device (robotic cutter) to remove protruding taps. Cut protruding taps so that protrusions are no greater than 3/4 inch. If a protruding tap cannot be removed by the cutting device, then a point repair may be performed. Obtain authorization from the Engineer before proceeding.
 - 2. To remove other obstructions, use a remote device. Pull or drive the device from manhole to manhole up to a continuous length of 500 feet using a solid steel mandrel, porcupine, root saw, bucket, robotic cutter or similar device to remove the obstruction. Select a device that is adequately sized to remove the obstruction.
- B. Excavation: Use excavation as the method of obstruction removal when installation of the liner in the sanitary sewer is in progress. If during the liner insertion operation, a collapsed sewer, off-set joint or other obstruction is encountered which prevents or blocks the passage or insertion of the liner, notify the Engineer for authorization to excavate. Uncover and remove the obstruction as follows:
 - 1. Excavate at the point where there is an obstruction. Use a trench safety system as required.
 - 2. Break out the existing sanitary sewer pipe (carrier pipe) as directed by the Engineer. Remove only that amount of material which is causing the obstruction. Remove the minimum amount of carrier pipe.
 - 3. Under such conditions, replacement of the carrier pipe is not required. Do not disturb the existing sewer bedding during excavation. However, if embedment is disturbed during the obstruction removal procedure, place cement-stabilized sand or crushed stone beneath the liner.
 - 4. When the liner is completely in place, encase it with crushed stone or cement-stabilized sand as shown on Drawing No. 02317-01, Sanitary Sewer Embedment and Trench Zone Backfill for Dry or Wet Stable Trench.

END OF SECTION