

SECTION SS-9

INTERNAL HOST PIPE REPAIR

PART 1	GENERAL
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1.01 SUMMARY

- A. The contractor shall provide all labor, materials, and equipment necessary to make the internal host pipe repairs as specified within the contract documents or as designated by the Engineer.
- B. Related Sections:
1. SS-3, By-Pass Pumping
 2. SS-4, Sewer Cleaning
 3. SS-5, Sewer Video Recording and Inspection
 4. SS-8, Open Cut Point Repairs
 5. SS-12, Cured-In-Place Pipe
 6. SS-14, Shotcrete Pipe Rehabilitation

1.02 REFERENCES (Not Used)

1.03 DEFINITIONS (Not Used)

1.04 SYSTEM DESCRIPTION (Not Used)

1.05 SUBMITTALS

The following submittal (A) shall be made with the Bid:

- A. Contractor's Qualifications. Submit copy of manufacturer's licensee certificate, if applicable. Submit list of three (3) similar regional jobs within the past three (3) years as well. Provide project information such as length of repair, pipe diameter, date complete, and project cost.

The following submittals (B-D) shall be made at the pre-construction meeting:

- B. Furnish the manufacturer's general product data and materials certifications.

- C. Material Certification. Written certification is required from the manufacturer stating that all materials are in conformance with the ASTM specifications.
- D. Material Safety Data Sheets. The Contractor shall submit Material Safety Data Sheets (MSDS) for each component of the system.

The following submittals (E-F) shall be made a minimum of ten (10) working days prior to lining for small diameter repairs:

- E. Point Repair Calculations. Furnish to the Engineer the detailed design calculations for each point repair location assuming a 100-year service life based on AWWA Manual MII standard for flexible tunnel liners. Each repair shall be designed to withstand internal and/or external loads as dictated by the site and pipe conditions. Assume the water table to be three (3) feet below the street (ground) level.
- F. Installation Procedures. The Contractor shall submit the manufacturer's detailed installation procedures.

The following submittal (G) shall be made immediately after the repairs have been completed:

- G. Post-installation tapes and logs. The Contractor shall submit two (2) copies of the post-installation CCTV inspection that shows the installed liner repair.

1.06 QUALITY ASSURANCE

- A. Codes. Perform all work in compliance with all federal, state, and local codes.
- B. Contractor Qualifications. The Contractor shall be a firm having a minimum of 3 years continuous successful experience in internal host pipe repair similar to that required for this Project.
- C. All contractors conducting work on public utilities within the City of Columbus must be certified/licensed with the City. To obtain a license/certification contact:

City of Columbus
Department of Public Utilities
910 Dublin Road
Columbus, Ohio 43215
<http://utilities.columbus.gov/Forms-Permits.htm>

- 1.07 DELIVERY, STORAGE AND HANDLING
- A. Delivery. Delivery of material shall be coordinated with other trades.
 - B. Storage of Materials. Storage shall be in accordance with the manufacturer's recommendations.
 - C. Handling. Handle all products with care. Only sound, undamaged products shall be used.
- 1.08 PROJECT/SITE CONDITIONS
- A. Coordination. Coordinate with other trades to prevent delays, omissions, or errors.
 - B. Environmental Requirements
 - 1. Do not work in rain, snow, or in presence of excessive amounts of water.
 - 2. Do not work in temperatures below the manufacturer's recommended temperature to obtain proper curing.
 - 3. Sewer cleaning and television inspection shall be completed prior to installation of the liner.
 - D. Safety. All work to be completed in conformance with all applicable safety standards, in particular OSHA Standard 29CFR 1910.146, Permit Required Confined Space Entry.
- 1.09 SEQUENCING (Not Used)
- 1.10 SCHEDULE (Not Used)
- 1.11 WARRANTY
- A. The Contractor shall guarantee all work as stated in the CMSC Section 109.12.
- 1.12 SYSTEM STARTUP (Not Used)
- 1.13 INSTRUCTION OF OWNER'S PERSONNEL (Not Used)
- 1.14 COMMISSIONING (Not Used)
- 1.15 MAINTENANCE (Not Used)

PART 2 PRODUCTS

2.01	MANUFACTURERS	(Not Used)
2.02	EXISTING PRODUCTS	(Not Used)

2.03 MATERIALS

Only materials approved by the City of Columbus, Division of Sewerage and Drainage, New Products Committee may be used for this project.

Small Diameter Pipe Repairs (Less than 48")

- A. Link-Pipe Grouting Sleeve.

Large Diameter Pipe Repairs (48" and Larger)

- A. Cementitious Materials. QUIKRETE Quick-Setting Cement No. 1240 or other cementitious materials such as shotcrete or pneumatically placed concrete.
- B. Mortar. Mortar shall comply with CMS, Item 602.02.
- C. Bricks. All brick shall conform to Grade MS as specified in ASTM C32, and shall meet CMS, Item 704.01.

2.04	MANUFACTURED UNITS	(Not Used)
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2.05 EQUIPMENT

- A. All equipment required for the proper installation of the internal point repair, including cables, sleeves, compressors, generators, pumps, valves, gauges, and accessories required for complete installation shall be in accordance with manufacturer's recommendations.

2.06	COMPONENTS	(Not Used)
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2.07	ACCESSORIES	(Not Used)
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2.08	MIXES	(Not Used)
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2.09	FABRICATION	(Not Used)
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2.10	FINISHES	(Not Used)
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2.11	SOURCE QUALITY CONTROL	
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PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS (Not Used)

3.02 EXAMINATION

- A. General. Examine areas and conditions within the sewer system in which materials and products are to be installed. Do not proceed with work until satisfactory conditions are present.
- B. Material. Materials shall be carefully inspected for defects prior to installation. All material found during the progress of the work to have flaws or defects shall be rejected. All defective materials furnished by the Contractor shall be promptly removed by the Contractor from the project site.
- C. Responsibility. The Contractor shall be responsible for all materials furnished by him and shall replace at his own expense all such material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include furnishing all materials and labor required to correct any defective installations prior to the final acceptance of the work.

3.03 PREPARATION

- A. Resident Notification. The Contractor shall notify all affected residents in writing of any utility service disruption two (2) working days prior to commencement of the work. Notification shall include an explanation of what work is to be done, its anticipated time frame, any cautionary measures the home owners should take (i.e. water in taps) and the contractor's contact information.
- B. Cleaning. All sewers to be repaired per this section shall be cleaned prior to completing repairs in accordance with SS-4.
- C. Bypassing Sewage. The Contractor shall bypass sewage around the sections of the sewer that are to be repaired as required by the manufacturer in accordance with SS-3.
- D. Line Obstruction. It shall be the responsibility of the Contractor to clear the sewer of obstructions, solids, protruding services, or collapsed pipe that will prevent the completion of the repairs. If inspection reveals an obstruction or condition that will compromise the repair installation, the Contractor shall select another means of making the point repair up to and including an open cut point repair. In addition, any equipment that is lost, broken, wedged, or stuck in

a pipe shall be removed by the Contractor at the Contractor's expense.

3.04 ERECTION (Not Used)

3.05 INSTALLATION

A. **Small Diameter Pipe Repairs (Less than 48")**

1. General. The Contractor shall supply design calculations based on the dimensions shown in the construction plans. Internal point repairs shall be designed to withstand internal and/or external pressures as indicated by site conditions.
2. Installation. The internal point repair shall be travel to the repair location on a carrier device within the existing pipe. Proper placement shall be achieved using a closed-circuit television camera to position the sleeve so that the final product will extend at least 6" into structurally sound pipe upstream and downstream of the repair. The point repair shall be installed per the manufacturer's recommendations.
3. Finish. All locks shall be engaged and resin supplied to each sleeve. During the guarantee period, any defects that will affect the integrity or strength of the repair shall be repaired at the Contractor's expense at the direction of the Engineer.
4. Sealing Sleeve at Termination of Repair. The repair shall make a tight seal at both termination points of the liner with no annular gaps.
5. Service Connections. The exact location and number of service connections shall be verified during the initial television inspection. The City will make the determination on which service connections are active. It shall be the Contractor's responsibility to accurately field measure all active service connections, which have been approved by the City, prior to ordering materials. The Contractor shall not obstruct or cover any active service connections when utilizing the link-pipe point repair method. The Contractor shall be responsible for restoring/correcting, without any delay, all missed or faulty reconnections, as well as any damage caused to property owners due to the Contractor's actions.

6. Final Television Inspection. The Contractor shall televise the point repair section in order to provide a detailed record of finished conditions and lateral connections (if present). When complete, the Contractor shall submit two (2) copies of the repair inspection, along with the accompanying logs which shall be printed clearly or typed. All CCTV work and logs shall be completed in accordance with SS-5.

B. Large Diameter Pipe Repairs (48" and Larger)

1. The repairs shall be completed as detailed in the contract documents. Installation methods may include but are not limited to, troweling the material into the host pipe, spray applying in the event that shotcrete or pneumatically placed concrete is used, and/or masonry repair utilizing bricks and mortar.
2. Locations to be repaired shall be agreed upon prior to beginning of the work. The Contractor shall provide the Engineer with CCTV and a list of locations with estimated repair area quantities noted in square feet, and shall proceed with the repair only upon authorization of quantities of this work by the Engineer. The Engineer shall have final discretion as to areas to be repaired and may direct either greater or lesser areas than the Contractor proposes to be repaired.
3. All area of missing or deteriorated brick shall be repaired or replaced prior to installation of the liner material. Repair shall be made by replacing missing bricks or by removing loose spalled materials and patching with a sound brick base with mortar, or by installation of cementitious material as indicated in section 3.05.F. Where brick is placed, all new masonry joints shall be smooth and completely filled with mortar. The mortar shall be composed of portland cement, and sand mixed in the proportion of one bag of cement to two cubic feet of sand. The sand shall be measured loose in a bucket or in some suitable measure of known volume. The cement and sand shall be mixed thoroughly and uniformly dry, and then wet with water to make a stiff paste which will be plastic under the trowel, but not so soft as to run after being placed. Mortar shall be used before it begins to stiffen. Mortar that has previously set shall not be re-mixed and used. Only potable water shall be used for mixing the mortar. In no case shall sewage be introduced into the mortar mix.

4. Service Connections. The exact location and number of service connections shall be verified during the initial television inspection. The City will make the determination on which service connections are active. It shall be the Contractor's responsibility to accurately field measure all active service connections, which have been approved by the City, prior to ordering materials. The Contractor shall not obstruct or cover any active service connections. The Contractor shall be responsible for restoring/correcting, without any delay, all missed or faulty reconnections, as well as any damage caused to property owners due to the Contractor's actions.
5. Final Television Inspection. The Contractor shall televise the repaired section in order to provide a detailed record of finished conditions and lateral connections (if present). When complete, the Contractor shall submit two (2) copies of the repair inspection, along with the accompanying logs which shall be printed clearly or typed. All CCTV work and logs shall be completed in accordance with SS-5.

3.06	APPLICATION	(Not Used)
3.07	CONSTRUCTION	(Not Used)

3.08 REPAIR/RESTORATION

- A. Where portions of the site, either inside or outside the contract limits, not designated for change or new work become damaged during the course of construction by the Contractor's operations, the Contractor shall repair or replace such damage to original or better condition in conformance with the Contract Documents.

3.09	RE-INSTALLATION	(Not Used)
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3.10	FIELD QUALITY CONTROL	(Not Used)
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3.11	ADJUSTING	(Not Used)
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3.12	CLEANING	(Not Used)
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3.13	DEMONSTRATION	(Not Used)
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3.14	PROTECTION	(Not Used)
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3.15 SCHEDULES

Small Diameter pipe repairs (less than 48")

- C. Payment will be made at the unit price bid per lineal foot as measured from the upstream termination point of the liner in the invert of the sewer to the downstream termination point of the liner in the invert of the sewer along the center line of the liner, complete, tested, and ready for service.

Large Diameter Pipe Repairs (48" and Larger)

- D. Payment for this item shall be per square foot of surface area of the interior point repair.

ITEM	UNIT	DESCRIPTION
SS-9	LF	Internal Host Pipe Repair
SS-9	SF	Internal Host Pipe Repair

END OF SECTION