

SECTION 00 91 13

ADDENDUM NO. 1

NOTICE is hereby given to prospective Bidders of the following information, clarifications, and modifications to the Bidding Documents. The Bidding Documents remain unchanged except as indicated below. Bidders must acknowledge receipt of this Addendum in the Bid Form and comply with the requirements for submission of Bids as set forth in the Bidding Documents.

The answers below are provided in response to questions and comments submitted by prospective Bidders.

" . . . Will the use of polyester or vinylester resins be accepted as alternatives to epoxy?"

Answer: Yes. See replacement Section 33 01 30.73 included with this Addendum.

" . . . Will (a polyester felt) tube be considered "or equal"?"

Answer: Yes. See replacement Section 33 01 30.73 included with this Addendum.

"Section 2.01, H (of Section 33 01 30.73) states that a sealing component is not allowed. What is meant by a sealing component? Why would a sealing component not be allowed? It would seem reasonable to assume that since the lateral CIPP is not likely to adhere to the host pipe then a sealing component would be required to prevent and/or reduce the risk of groundwater tracking between the liner and the host pipe. A sealing component is required in the main line CIPP specifications (Section 33 01 30.72) for this project (section 3.07). Please clarify this requirement and consider allowing the use of a sealing component between the CIPP lateral liner and host pipe as is currently allowed in the main line CIPP specifications."

Answer: See replacement Section 33 01 30.73 included with this Addendum.

"Specification Section 33 01 30.72, which pertains to the CIPP lining of the main line sewers, allows polyester and vinylester resin systems. It does not require the use of epoxy resins. (Can it be assumed) that the CIPP lateral lining systems would be allowed to use the same resin systems(?)"

Answer: Yes. See replacement Section 33 01 30.73 included with this Addendum.

"Specification Section 33 01 30.72, which pertains to the CIPP lining of the main line sewers, specifies the CIPP liner physical properties to be no less than 4,500 psi and 250,000 psi for flexural strength and modulus respectively. These requirements also comply with ASTM F1216. (Can it be assumed) that the CIPP lateral lining systems would be allowed to use the same minimum physical properties(?) . . ."

Answer: Yes. See replacement Section 33 01 30.73 included with this Addendum.

NOTICE is hereby given that the Bidding Documents have been modified and replacement Section 33 01 30.73 is issued herewith.

Section 33 01 30.73 has an Issue Date of May 2015, contains reference to “ADDENDUM NO. 1” in the footer, and text changes are identified by double-underline for additions and ~~Strikeout~~ for deletions.

Prepared and Issued by Woodard & Curran (Engineer) on behalf of:
The City of Quincy
1305 Hancock Street
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SECTION 33 01 30.73

SERVICE LATERAL REHABILITATION

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes
- B. Rehabilitate active sewer laterals without excavation by installation of ~~an epoxy~~
resin vacuum impregnated, one-piece main and lateral liner (MTH – Main to House) in the form of an internal sleeve. Clean and CCTV inspect laterals.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: in accordance with Division 01 General Requirements.

1.03 REFERENCES

- A. Reference Standards
 - 1. American Society for Testing and Materials (ASTM)
 - a. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials-
 - b. ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
 - c. Characteristics of Plastic Pipe by Parallel-Plate Loading
 - d. ASTM D2990 - Standard Test Methods for tensile, compressive, and flexural creep and creep-rupture of plastics
 - e. ASTM D5813 - Standard Specification for Cured-In-Place Thermosetting ~~Epoxy~~Resin Sewer Piping Systems.
 - f. ASTM FI216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of ~~a Epoxy a~~
Resin Impregnated Tube
 - 2. National Association of Sewer Service Companies (NAASCO) Recommended Specification for Sewer Collection Systems Rehabilitation

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

- A. Submit in accordance with the Division 01 General Requirements.
- B. Description of system, equipment, material, and name of manufacturer of the material components (liner and resin) proposed for the service connection rehabilitations.
- B. Detailed procedure for installing service lateral liner.
- C. Independent laboratory testing results of CIPP samples described in Article 3.07
- D. Description of system proposed for handling existing sewer flows per Section 01 51 40.
- E. Safety Data Sheets (SDS) for all chemicals to be used
- F. Source and Field Quality Control Submittals
 - 1. Video recording of the rehabilitation work and one-year Warranty Inspections on DVD, verified for accuracy and quality prior to submittal.
- G. Qualification Statements
 - 1. Qualifications of the firm/personnel performing the Work including a list of at least 10 reference projects.
- H. Proposed schedule a minimum of two weeks prior to the planned Work.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.
- B. Qualifications
 - 1. Provide that the Work specified is performed by a company or personnel with a minimum 5 years of experience. Provide that supervisory personnel have a minimum 5 years of experience and shall be present at the Site during performance of services specified.

1.07 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

- B. Notify Owner immediately if Site conditions prevent access to manholes or pipes identified as part of the Work.
- C. Service lateral connections may be a combination of tees, wyes or break-in taps or varying sizes and angles ranging from 30 to 90 degrees. Service laterals may enter the main line sewer at any point on the circumference including perpendicular, tangential, etc.
- D. Service lateral connections may be 4-inch diameter, 5-inch diameter, or 6-inch diameter from the 8-inch diameter, 10-inch diameter, 12-inch diameter, 15-inch diameter, 18-inch diameter, or 24-inch diameter mainline.

PART 2 – PRODUCTS

2.01 SERVICE LATERAL CONNECTION (MTH) LINER

- A. The MTH lining material shall be a polyester felt or fiberglass/polyester-needle fleece vacuum epoxyresin-impregnated or equivalent material tube, matching the diameter of the lateral pipe, which is inserted into the service lateral to be rehabilitated and cured-in-place by an acceptable curing method. The resin epoxy shall be suitable for the design conditions as well as the curing process. The MTH shall provide a service life of 50 years and shall have the minimum structural properties listed below.

<u>Mechanical Property</u>	<u>Minimum Initial</u>
Flexural Strength (ASTM 0790)	10,000 <u>4,500</u> psi
Flexural Modulus of Elasticity (ASTM 0790)	400,000 <u>250,000</u> psi

- B. The MTH liner must be a seamless one piece product affixed to the walls of the lateral pipe and at the junction between the pipe and main sewer. The junction between the collar and the lateral sleeve must be watertight and will consist of a lateral portion and a mainline portion.
- C. The MTH liner system shall consist of a sectional liner in the mainline (full wrap around the circumference of the main line extending 5” on either side of the service) and the continuous liner shall have the capacity to extend to within 10 feet of the building foundation. The liner shall form a continuous, one piece, tight fitting, corrosion resistant and verifiable non-leaking cured in place pipe. No component of the liner (i.e. lateral tube to mainline piece) shall be glued or sewn fused in the field prior to installation. The material shall be capable of conforming to offset joints, bells and disfigured pipe sections.
- D. The carrier packer shall be specifically designed for various diameter services connections. It shall be manufactured to conform to either a wye, tee or break-in type connections. The mainline portion of the carrier packer will accommodate pipe diameters ranging from 8-in to 24-in. A corrosion resistant epoxy-resin compatible with the installation process shall be used.

- E. The MTH shall be designed, fabricated, and installed for the actual conditions encountered for this application including the material of the host pipe, in accordance with the applicable provisions of ASTM F1216, and shall meet the following minimum design conditions:
1. AASHTO H-20 live load with one trucks passing.
 2. Soil Weight 120 pounds per cubic foot. Coefficient of friction $Ku'=0.130$.
 3. Groundwater: At the ground surface
 4. Fully deteriorated pipe with 2 percent (min.) deformation. If ovality of existing pipe is found to be worse, use actual percent up to 5 percent (max.).
 5. Soil Modulus 1,000 psi.
 6. Factor of Safety = 2
 7. Soil Depth: Depth of Cover will be determined by field measurements.
- F. The MTH shall be designed to withstand all imposed loads, including live loads and, if applicable, hydrostatic pressure. The MTH liner shall have sufficient wall thickness to withstand all anticipated external pressures and loads that may be imposed after installation. The design shall be performed and certified by a professional engineer licensed by the Commonwealth of Massachusetts.
- G. The finished MTH product shall be which when cured is chemically resistant to domestic sewage over the expected life time of the rehabilitated pipe. The liner material and epoxy-resin shall be completely compatible and provided as a system from one manufacturer.

~~H. — A sealing component used to form a sealing bond between the lateral liner and the host lateral and main pipe walls will not be allowed. The lateral liner system shall create epoxy resin migration into the defect/joints of the existing lateral. A combination of mechanical and chemical bonding shall be created between the lateral lining system and existing host pipe.~~

2.02 RESINEPOXY FOR MTH LINER

- A. The resinepoxy system shall meet the requirements of ASTM F1216, Section 5.2. The resinepoxy installed MTH liner system shall produce an MTH that will comply with the structural requirements specified herein and shall provide chemical resistance for the flow media in the gravity pipe. The resinepoxy shall be compatible with the rehabilitation process, shall be able to cure in the presence or absence of water, and shall have an initiation temperature for cure as recommended by the resinepoxy manufacturer.

PART 3 – EXECUTION

3.01 COORDINATION

- A. Provide a minimum two weeks notice of proposed schedule as described above.
- B. Contracts, that include both the relining of the main line and the installation of MTH seal product, require the main line relining contractor identify (size and location), video document and notify the Owner which lateral connections are deemed unfit for the MTH product. Where the contract is only for installing the MTH product, the installation contractor shall inform the Owner of service laterals which cannot be installed.
- C. Service laterals in which a MTH product cannot be installed will be identified, documented, video recorded, and the Owner's representative will be informed of the conditions encountered. The contractor will not attempt to install a MTH product in these connections unless directed by the Owner's representative.
- D. Discharge, bypass, or flooding of sewage, cleaning water, or debris to public or private property including the ground, surrounding residences, and downstream sewers is prohibited. Contractor shall immediately and completely clean and repair any damage resulting from their activities to the satisfaction of the Owner and Engineer.

3.02 PREPARATION

- A. Service lateral cleaning and CCTV inspection shall be completed in accordance with 33 31 15 and as detailed below.
- B. The Contractor shall clear the line of obstructions such as solids, roots, or broken pipe that will prevent the insertion of the liner. A high speed rotating hydraulic cutter shall be used to cut roots, grease or other obstructions in the pipe. The cut shall be made flush with the wall of the pipe to be restored, and the debris shall be pushed down the lateral pipe to the main pipe and to the downstream manhole and is to be removed by the contractor. If inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, the Contractor shall notify the Engineer and the cleaning effort shall be abandoned. The Contractor shall confirm that the sewer is clean enough to ensure an effective lining. The line segment shall not be lined until approved by the Engineer.
- C. Built-up deposits on the main and lateral pipe walls shall be removed. The removal shall reach at least one foot beyond the MTH product to allow the bladder to inflate tightly against the pipe walls ensuring a smooth transition from MTH product to the existing pipe wall.
- D. Where the main pipe has been lined previously with a CIPP liner, a check should be made to ensure the prior lateral reopening work created a lateral opening that is flush with the lateral pipe. If this is not the case, the mainline CIPP must be trimmed back using a lateral cutter at no additional cost to the Owner.

- E. The Contractor shall be responsible, if needed, for bypassing of sewage during the installation of the MTH product. In cases where the temporary backup of sewage is accepted as a replacement for bypassing, the Contractor is responsible for all damage caused.

3.03 INSTALLATION

- A. Lateral liner shall be installed from the mainline sewer without the assistance of a cleanout. Mainline sewer may be lined (CIPP) or unlined pipe. Existing service laterals shall be flush with the mainline sewer wall prior to service lateral liner installation. The liner shall consist of a sectional liner in the mainline (full wrap around the circumference of the main line extending 5” on either side of the service) and the continuous liner shall have the capacity to extend to within 10 feet of the building foundation.
- B. Where active infiltration is present and when it is recommended by the liner manufacturer, the infiltration shall be stopped in advance by grouting.
- C. Service lateral liner material shall be vacuum impregnated on site with the epoxy resin immediately prior to installation. Impregnation should be carried out under vacuum using ~~electric impregnation table with~~ pinch rollers set at the correct gap as per the manufacturer’s instructions. Impregnation should take place in a clean, temperature controlled cab in which the materials are protected from direct sunlight, objects which may damage the coating.
- D. ~~Impregnation should not take place using a manual roller in which the material is subject to excessive pressure and that the materials are squeezed resulting in a resin slug. All the calculated resin shall be confined to the liner to ensure the correct mechanical properties can be achieved.~~
- E. Impregnation should not take place outside in an uncontrolled environment in which the materials are exposed to the elements. The liner should not be placed on the ground where it is susceptible to damage from objects such as stones, grit, glass etc.
- F. During and upon completion of the impregnation process the liner should be stored in a container to avoid damage prior to loading the material into the installation device.
- G. The MTH product shall be loaded inside a pressure apparatus above ground. The pressure apparatus, with an end attached to a robotic manipulator device, shall be positioned in the mainline pipe at the service connection that is to be rehabilitated. The robotic device together with a television camera will be used to align the repair product with the service connection opening. The robotic device shall hold the collar in place while air pressure, supplied to the pressure apparatus through a hose, shall be used to invert the liner into the lateral pipe. The insertion pressure will be adjusted to fully deploy the MTH product into the lateral connection and hold the MTH product tight to the main and lateral pipe walls.

- H. Curing shall be accomplished by utilizing the appropriate medium in accordance with the manufacturer's recommended cure schedule. The curing source or in and output temperatures shall be monitored and logged during the cure cycles if applicable. The manufacturer's recommended cure method and schedule shall be used for each line segment installed, and the liner wall thickness and the existing ground conditions with regard to temperature, moisture level, and thermal conductivity of soil, per ASTM as applicable, shall be taken into account by the Contractor.
- I. For heat-cured liners, if any temperature sensor or multiple sensors do not reach the temperature as specified by the manufacturer to achieve proper curing or cooling, the installer can make necessary adjustments to comply with the manufacturer's recommendations. The system computer should have an output report that specifically identifies each installed sensor station in the length of pipe, indicates the maximum temperature achieved and the sustained temperature time. Each sensor should record both the maximum temperature and the minimum cool down temperature and comply with the manufacturers recommendations. For UV Cured Liners, all light train sensor readings, recorded by the tamper proof computer, shall provide output documenting the cure along the entire length of the installed liner. The cure procedure shall be in accordance with the manufacturer's recommendations
- J. The finished MTH product shall be free of dry spots, lifts, delamination and excess epoxyresin. The installed MTH product should not inhibit the post installation video inspection, using a closed circuit television camera, of the mainline and service lateral pipes or future pipe cleaning operations.
- K. The Contractor shall inform the Engineer of service laterals in which a MTH product cannot be installed due to preexisting conditions. These services will be identified, documented, video recorded, and the Engineer will be informed of the conditions encountered. The Contractor will not attempt to install a MTH product in these services unless directed by the Engineer.

3.04 FIELD TESTING AND ACCEPTANCE

- A. Following installation of the service lateral liners, conduct a final, video recorded, color television inspection of the completed work including the service lateral connections at the sewer main and the full length of all service laterals lined during the progress of the work. Copies of these recordings and those made prior to the liner installation shall be submitted to the Engineer for approval and shall be retained by the Owner.
- B. Field acceptance of the liner shall be based on the Engineer's evaluation of the installation including TV inspection video recordings and a review of certified test data for the installed pipe samples.
- C. Groundwater infiltration of the liner shall be zero.

- D. There shall be no evidence of splits, cracks, breaks, lifts, kinks, delamination or crazing in the liner.
- E. If any defective liner is discovered after it has been installed, it shall be removed and replaced with either a sound liner or a new pipe at no additional cost to the Owner.

3.05 WARRANTY INSPECTION

- A. Warranty Inspection must commence within 45 calendar days prior to expiration of the Warranty Period or within 10 days of receipt of notice from Owner to commence Warranty Inspection. Within 14 calendar days prior to expiration of the Warranty Period (351 days from Substantial Completion), perform CCTV inspection of 10 percent of rehabilitated service connections in accordance with Section 33 31 15 in the presence of the Engineer. Specific locations will be selected at random by Owner.
- B. Perform CCTV inspection of the all rehabilitated service laterals if abnormalities and defects are discovered after inspection of a portion of the rehabilitated service laterals at no additional cost to Owner.
- C. Repair and replace abnormalities and defects discovered during the Warranty Inspection as recommended by the manufacturer and as specified.

3.06 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION