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Brian Terry, Vice President
David Ausmus, Board Member
David Wilt, Board Member
Renita Waldron, Secretary
Stephanie Wilson, General Manager

ADDENDUM NO. 1
TO THE
SANITARY SEWER MAIN AND MANHOLE REHABILITATION BID DOCUMENTS
MACON, MISSOURI

DATE: Thursday, February 4, 2021

TO: Prospective Bidders

Macon Municipal Utilities is issuing Addendum No. 1 in association with the public bid advertisement on January 20, 2021 for sanitary sewer line cured-in-place-pipe relining and cementitious manhole rehabilitation.

1. On the Manhole Lining and Repairs document, the length of fiberglass rods and thickness of spraying was changed from 2 inches to 1/2 inch.
2. On the Unit Price Bid Proposal form, the acknowledgement of the addendum is noted and the due date for bids has been changed from Friday, February 5, 2021 at 2:00 pm to Wednesday, February 10, 2021 at 2:00 pm.

The addendum is available for public inspection on Macon Municipal Utilities website at <https://maconutilities.com/news-updates/> or at the Business Office located at 106 W. Bourke Street, Macon, Missouri between the hours of 8:00 am and 5:00 pm, Monday through Friday.

**UNIT PRICE BID PROPOSAL
MACON MUNICIPAL UTILITIES**

SANITARY SEWER LINE AND MANHOLE REHABILITATION

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	PRICE	EXTENSION
1	CIPP Lining 8" x 6mm With Mastic End Seals	L.F.	2473		
2	Cementitious Manhole Rehabilitation 48" Manholes	V.F.	226		
3	Test/Seal of Lateral Connections up to 30" (5 gallons Allowance Per Lateral)	Each	>20		
4	Acrylamide Gel Grout Pumped in Excess Of Allowance Per Lateral	Gallon			
5	Mobilization, Demobilization – 8"CIPP	L.S.	1		
6	Mobilization, Demobilization – Manhole Rehabilitation	L.S.	1		
7	Mobilization, Demobilization – Pressure Test/Grout Lat. Connect.	L.S.	1		
8	Site Restoration and Seeding & Mulching	L.S.	1		

Total Bid - Sewer Line and Manhole Rehabilitation \$ _____

_____ (Use Words)

(\$ _____).
(Use Figures)

Bidder acknowledges receipt of the following Addendum:

Addendum No. 1 Acknowledgement

SIGNATURE

SIGNATURE

DATE

CONTRACTOR: _____
ADDRESS: _____
PHONE NO.: _____

**** Note: Bids due Wednesday, February 10, 2021 by 2:00 PM. at the address listed below.
Bids will be opened and read at 2:00 PM.
Project is requested to be completed by October 29, 2021
Extension of time can be granted to December 3, 2021**

For questions, please call: Mike Llewellyn of MMU (660-651-4784)

Bids Due at: Macon Municipal Utilities
Attn: Stephanie Wilson, General Manager
106 W. Bourke St.
P.O. Box 569
Macon, MO 63552

MANHOLE LINING AND REPAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manhole lining
- B. Invert Repair

1.2 RELATED SECTIONS

- A. City of Macon, Missouri - Standard Specifications for Gravity Sanitary Construction.
- B. Repair of Manhole Defects
- C. Sanitary Sewer Rehabilitation

1.3 REFERENCES: The following publications form a part of these specifications to the extent indicated by references thereto. Only the most recent revisions of these publications shall be used.

- A. ASTM C - 94 Specification for Ready-Mixed Concrete
- B. ASTM C - 293 Test Method for Flexural Strength of Concrete
- C. ASTM C - 321 Test Method for Bond Strength of Chemical-Resistant Mortars
- D. ASTM C - 495 Test Method for Compressive Strength of Lightweight Insulating Concrete
- E. ASTM C - 496 Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
- F.. ASTM C - 579B Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing
- G. ASTM C - 596 Test Method for Drying Shrinkage of Mortar Containing Portland Cement

1.4 SUMMARY OF WORK FOR MANHOLE LINING

- A. Manhole lining under this specification shall govern all work, materials, and equipment required for the following:
 - 1. Substrate rehabilitation for the purpose of eliminating infiltration, providing corrosion protection, repair of voids, and restoration of the structural integrity of the substrate as a result of applying a monolithic fiber-reinforced structural/structurally enhanced cementitious liner to the wall and bench surfaces of brick, concrete, or any other masonry construction material.
- B. Manhole lining shall be applied by an applicator who is approved and trained by the manufacturer of the lining system materials. All aspects of the installation shall be in accordance with the manufacturer=s recommendation and per the following specifications.
- C. Manhole lining as referred to on the Drawings and specified herein shall include:
 - 1. the removal of any loose and unsound material.
 - 2. cleaning of the area to be sprayed with high pressure water.
 - 3. the repair and filling of voids.
 - 4. the repair and sealing of pipe seals, pipe invert and benches.
 - 5. the elimination of active infiltration prior to making the application.
 - 6. the spray application of a cementitious mix to form a structural/structurally enhanced monolithic cementitious liner.

1.5 SUBMITTALS

- A. Submit under provisions of this section.
- B. Product data for review. Provide data indicating manhole lining products, test results, manufacturer=s certifications, and warranty.

1.6 MEASUREMENT AND PAYMENT

B. **Infiltration Control Material:** A rapid setting cementitious product specifically formulated for leak control, shall be used to stop minor water infiltration and shall be mixed and applied according to manufacturer=s recommendations and shall have the following minimum requirements:

1.	Compressive strength	ASTM C109	400-600 psi, 1 hour 1800-2400 psi, 24 Hrs
2.	Expansion	ASTM C827	.10%
3.	Sulfate Resistance	ASTM C267	No weight loss after 15 cycles, 2000 ppm; test continuing
4.	Freeze/Thaw	ASTM C-666, 100 cycles A	Method A@
5.	Pull out strength	ASTM C234	14000 lbs.
6.	Placement Time		<1.0 Minute

C. **Grouting Material:**

1. A cementitious grout shall be used for stopping very active infiltration and filling voids and shall be mixed and applied according to manufacturer=s recommendations. The cementitious grout shall be volume stable and have a minimum twenty-eight (28) day compressive strength of 250 psi and a one (1) day compressive strength of 50 psi.
2. Chemical grouts may be used for stopping very active infiltration and shall be mixed and applied per manufacture=s recommendations.

D. **LINER MATERIAL**

Cementitious liner products shall be used to form a structural monolithic liner covering all interior substrate surfaces and shall have the following minimum requirements:

1. Compressive Strength ASTM C-109, >3000 psi
2. Tensile Strength ASTM C-496, >300 psi
3. Flexural Strength ASTM C-78, >600 psi

4. Shrinkage @ 90% R.H. ASTM C-596, 0%
5. Bond ASTM C-952, >130 psi
6. Density, when applied 105 pcf + 5 pcf
7. The material shall be made with Type I or Type III Portland Cement and shall be used according to manufacturers= recommendations.
8. The material shall be factory blended requiring only the addition of water at the job site. The bag weight shall be 50-51 pounds. The cement content shall be 50%-60% of total bag weight. The content shall have a dry bulk density of 54-56 pounds per cubic foot and when mixed with the manufacturers= recommended amount of water, it shall have a wet density not to exceed 105 pcf +/- 5 pounds and shall yield a minimum of 0.63 cubic foot per bag.
9. **The material shall be reinforced with alkaline resistant fiberglass rods not less than 1/2" in length, nor greater than 5/8 inches.**
10. The material shall meet or exceed industry standards and shall not have any basic ingredient that exceeds the EPA maximum allowable limit for any heavy metal.
11. Approved materials are:
 - a. Parson's Environmental Manhole Liner
 - b. Permaform MS 10,000
 - c. Strong Seal MS2-A
 - d. Owner approved equal

E. **WATER:** Water used to mix product shall be clean and potable. Questionable water shall be tested by a laboratory per ASTM C-94 procedure. Potable water does not need to be tested.

F. **OTHER MATERIALS:** No other material shall be used with the mixes described in A, B, C, and D without prior approval or recommendation from the material supplier.

G. **HISTORY:** The product must have a minimum of five (5) years= history of being used for reconstruction of sanitary sewer system manholes. The manufacturer must provide a list of at least thirty (30) projects completed during the past three (3) years.

- H. **APPLICATOR CERTIFICATION:** The applicator must be factory-trained and provide a copy of a certificate acknowledging status as an approved applicator.

EXECUTION

MANHOLE LINING:

- A. **Equipment:** The applicator must use equipment designed and manufactured by the material supplier specifically for the application of cementitious liners in sanitary sewer system manholes. The manufacturer must provide a list of at least twenty (20) customers using the equipment for application of a cementitious liner in sanitary sewer system manholes.

B. **Application:**

1. **Preparation:**

- a. Place covers over invert to prevent extraneous material from entering the sewer lines.
- b. All foreign material shall be removed from the manhole wall and bench using a high pressure water spray (minimum 1,200 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with patching material as specified herein. The surface to be repaired must be clean and free of any loose materials with walls totally saturated with water.
- c. Active leaks shall be stopped using infiltration control material according to manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application. After application the weep holes shall be plugged with infiltration control material prior to the application of the final coat. When severe infiltration exists, drilling may be required in order to pressure grout using a cementitious grout or chemical grout, as specified herein for grouting material. Manufacturer's recommendations shall be followed when pressure grouting is required.
- d. Only existing, cast iron steps determined to be in sound structural condition by the Resident Observer shall be preserved and prepared for the lining process. All rebar steps and unsound cast iron steps shall be removed and the wall repaired prior to lining.

2. **Invert, pipe seal and bench repair:**

- a. After all preparations have been completed, remove all loose material and wash wall again.
 - b. Any bench, invert, pipe seal and/or service line repairs shall be made at this time using patching material and shall be used per manufacturer=s recommendations.
 - c. Invert repair shall be performed on all inverts as indicated on plan sheets or where infiltration is present or when vacuum testing is specified. After blocking flow through the manhole, and thoroughly cleaning invert, the patching material shall be applied to the invert in an expeditious manner. The material shall be troweled uniformly onto the damaged invert at a minimum thickness of 2 inch at the invert extending out onto the bench of the manhole sufficiently to tie into the structural/structurally enhanced monolithic liner to be applied. The finished invert surfaces shall be smooth and free of ridges. The flow may be reestablished in the manhole within thirty (30) minutes after placement of the material
3. Mixing:
- a. For each bag of product, use the amount of water or water settings required per manufacturer=s recommendations and mix for thirty (30) seconds to one (1) minute after all materials have been placed in the mixer, using the approved equipment for mixing and application.
 - b. Prepared mix shall be discharged into a hopper and mixing of another batch shall continue to occur in such a manner as to allow spraying continuously without interruption until each application is complete.
4. Spraying: On new, poured-in-place, or precast concrete manholes, a single application of the liner mix shall be spray applied to a total thickness of 1/2 inch in one application. This requires the manufacturer=s consultation and approval.
- a. Base coat application: The surface shall be clean and free of all foreign material and shall be damp without noticeable free water droplets or running water, but totally saturated, just prior to application of each coat. Materials shall be spray applied from the bottom of the wall to the top, to a minimum uniform thickness to ensure that all cracks, crevices, and voids are filled and a relatively smooth surface remains after light troweling. The light troweling is performed to compact the material into voids and to set the bond.
 - b. Final Application: A final application, mixed as specified in Part 2, is applied after the base coat applications have begun to take an initial set (disappearance of surface sheen which could be fifteen (15)

minutes to one (1) hour depending upon ambient conditions). The final application shall be applied to assure a minimum total thickness of 1/2 inch. Again, application shall be from bottom up. The surface is then troweled to a relatively smooth finish being careful not to over trowel so as to bring additional water to the surface and weaken it. Manufacturers recommendations shall be followed when more than twenty-four (24) hours have elapsed between applications.

- c. **Bench application:** The wooden covers shall be removed at this time and the bench sprayed with materials mixed as specified in Part 2 and spray applied in such a manner that a gradual slope is produced from the walls to the invert with the thickness at the edge of the invert to be no less than 1/2 inch. The wall/bench intersection shall be rounded to a uniform radius the full circumference of the intersection.

C. **Curing:** Care should be taken to minimize exposure of applied product to sunlight and air movement. If application of second coat is to be longer than fifteen (15) minutes after completion of application of first coat, the structure shall be covered. At no time should the finished product be exposed to sunlight or air movement for longer than fifteen (15) minutes before covering or closing access. In extremely hot and arid climates, manhole should be shaded while application is in process. Contact manufacturer for curing compound recommendations.

- 1. The final application shall have a minimum of four (4) hours cure time before being subjected to active flow.
- 2. Traffic shall not be allowed over substrates for 24 hours after reconstruction has been completed.

D. **Weather:** No application shall be made to frozen surfaces or if freezing is expected to occur within the substrate within twenty-four (24) hours after application. If ambient temperatures are in excess of 95 degrees F, precautions shall be taken to keep the mix temperature at time of application below 90 degrees F. Mix water temperature shall not exceed 85 degrees F. Chill with ice if necessary.

E. **Product Testing:** Four three (3)-inch by six (6)-inch test cylinders or six two (2)-inch cubes shall be cast each day or from every fifty (50) bags of product used, and shall be properly packaged, labeled and returned to manufacturer for testing in accordance with the Owner=s or manufacturer=s directions for compression strength testing as described in ASTM C109 procedures.

F. **Acceptance Testing:** Contractor shall test rehabilitated manholes as follows:

- 1. Visually verify the absence of leaks. Visible leaks shall be corrected immediately.

2. Perform an exfiltration test. For manholes zero to six (0-6) feet deep, if the water loss is one (1) inch or less in five (5) minutes, the manhole is acceptable. For manholes over six (6) feet deep, if water loss is one (1) inch or less or less plus 1/8 inch per additional foot of depth in five minutes, the manhole is acceptable.

G. Approved Installers are:

1. Ace Pipe Cleaning, Inc.
2. Dobson-Davis Company, Inc.
3. Municipal Pipe Tool Co, LLC.
4. Spray Com Inc.
5. Visu-Sewer Clean & Seal, Inc.
6. Owner approved alternate

END OF SECTION