

Memorandum

MIAMI-DADE
COUNTY

Date: September 22, 2015

To: Gary Hartfield, Division Director
ISD, Small Business Development

From: Vivian Forhat-Diaz
Engineer 3
Miami-Dade Aviation, Facilities Management - Project Administration

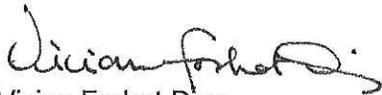
Subject: Request for MCC 7360 Solicitation – Cured In Place Pipe Liner installation at various MDAD locations; RPQ# 10045510

The Miami Dade Aviation Department (MDAD) respectfully requests that you review the attached recommendation to access the Miscellaneous Construction Contract MCC 7360 for the Cured In Place Pipe (CIPP) Liner Installation on Damaged//Deteriorated Sewer Pipes.

The scope of work for this Request for Price (RPQ) includes all labor, material & equipment required for the inspection of the affected area with closed circuit television (CCTV), following with the installation of a cured-in-place pipe liner and re-inspection after repairs are performed. The total contract allocation for this RPQ will be \$ 84,000.00.

In order for a CIPP liner installer to be considered as commercially proven, the installer must satisfy all insurance, financial, and bonding requirements of the Owner, and must have had at least 5 (five) years active experience in the commercial installation of the product. As a result, MDAD hereby request authorization to access MCC 7360 and recommend that no goals be established and/or assigned for this scope of work.

Thank you in advance for your cooperation.



Vivian Forhat-Diaz,
Engineer 3
MDAD – Facilities Management

Attachments: Project Analysis

CC: Ralph Cutie MDAD, Ana Finol MDAD, Joaquin Menendez MDAD, Laurie Johnson ISD, Coralee Taylor ISD, File

DEPARTMENT INPUT
CONSTRUCTION CONTRACT/PROJECT MEASURE ANALYSIS AND RECOMMENDATION

Check applicable Ordinance(s): 90-143 Responsible Wage and Benefits 03-237 (formerly 03-1) Community Workforce Program

PROJECT INFORMATION See attachment

Contract/Project/*Work Order No.: RPQ# 10045510

*Reference corresponding project number when submitting a work order

Contract/Project Title: Cured In Place Pipe Liner installation at various MDAD locations

Description/Scope of Work: Provide all labor, material & equipment required for the inspection of the Damaged / Deteriorated Sewer Pipes at various MDAD locations with closed circuit television (CCTV), following with the installation of a cured-in-place pipe liner and re-inspection after repairs.

Estimated Cost: \$ 84,000.00 Funding Source: MDAD Reserve Maintenance Fund

Location of Project: (street address or beginning and ending points) i.e. 12345 NE 23rd Ct or Starts at 135 St. ends at 145 St.
Various TBD locations throughout MDAD's facilities and cargo buildings

PROJECT ANALYSIS FOR GOAL RECOMMENDATION (CWP) See attachment

Engineer/Department or Agency's estimated required workforce for Project Work Order :

Trade/Skills Required	Est. # of workforce required per trade	Est. # of total days to complete job
Pipelines Engineering or Underground		90
Utility and Excavation		

Comments: _____

PROJECT ANALYSIS FOR GOAL RECOMMENDATION (CSBE) See attachment

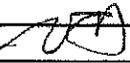
Sub-Trade	Est. Cost	% of Item to Base Bid	Availability

RECOMMENDATION

Set-Aside: Level 1 Level 2 Level 3 Trade Set-Aside Sub-Contractor Goal Workforce Goal No Measure

Basis for Recommendation: Insufficient SBE-Construction vendors

Date submitted to DBD: 09/22/15

Contact Person: Vivian Forhat-Diaz 

Telephone No.: 305-876-8311

**MIAMI-DADE AVIATION DEPARTMENT
CURED-IN-PLACE PIPE LINING**

PART 1 -- GENERAL

1.01 SCOPE

- A. It is the intent of this specification to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube which is formed to the original conduit and cured to produce a continuous and tight fitting Cured-In-Place Pipe (CIPP).
- B. The work specified in this Section includes all labor, materials, accessories, equipment and tools necessary to install and test CIPP lining in main lines.

1.02 GENERAL

- A. This specification references ASTM F1216 (Rehabilitation of pipelines by the inversion and curing of a resin-impregnated tube), ASTM F1743 (Rehabilitation of pipelines by pulled-in-place installation of a cured-in-place thermosetting resin pipe), and ASTM D790 (Test methods for flexural properties of unreinforced plastics) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

1.03 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information to the Miami-Dade Aviation Department (OWNER) for review in accordance with OWNER standards.
- B. With the bid, the following submittals are required.
 - 1. Documentation as outlined herein under the section titled, PRODUCT AND INSTALLER ACCEPTABILITY, including installation references of projects that are similar in size and scope to this project. The submittal shall include, at a minimum, the client contact name, phone number, and the diameter and footage of pipe rehabilitated. Documentation for product and installation experience must be satisfactory to the OWNER.
- C. After contract award, the following submittals are required.
 - 1. Detailed design calculations as specified herein under the section titled, MATERIALS FOR MAIN LINES.
 - 2. Various test results as specified herein under the section titled, TESTING REQUIREMENTS.
 - 3. Documentation as specified herein under the sections titled WET-OUT AND CURE REPORT and TELEVISION SURVEY.

1.04 PRODUCT AND INSTALLER ACCEPTABILITY

- A. Since sewer products are intended to have a 50 year design life, and in order to minimize the OWNER'S risk, only proven products and installers with substantial successful long term track records will be approved.
- B. Products and installers seeking approval must document an ability to meet all of the following criteria to be deemed commercially acceptable:
 - 1. For a product to be considered commercially proven, a minimum of 1,000,000 linear feet or 4,000 manhole-to-manhole line sections of successful wastewater collection system installations in the U.S. must be documented to the satisfaction of the OWNER to assure commercial viability. In addition, at least 250,000 linear feet of the product shall have been in successful service within the State of Florida for a minimum of five years.
 - 2. For an installer to be considered as commercially proven, the installer must satisfy all insurance, financial, and bonding requirements of the OWNER, and must have had at least 5 (five) years active experience in the commercial installation of the product. For sewer mains, the installer as

a firm must have successfully installed at least 250,000 feet of the product in wastewater collection systems in Florida. Acceptable documentation of these minimum installations must be submitted to the OWNER.

3. The CONTRACTOR must be approved by the product manufacturer to install the proposed lining materials.
4. The CONTRACTOR's superintendent must demonstrate at least 3 years of experience in this geographic area with the systems being bid or the CONTRACTOR shall provide the services of an authorized manufacturer's representative for the duration of the project.
5. Sewer rehabilitation products submitted for approval must provide third party test results supporting the long term performance, structural strength, and chemical resistance of the product and such data shall be satisfactory to the OWNER. Test samples shall be prepared so as to simulate installation methods and trauma of the product. No product will be approved without independent third party testing verification.

PART 2 -- PRODUCTS

2.01 MATERIALS FOR MAIN LINES

- A. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge breaks and missing sections of the existing pipe, and stretch to fit irregular pipe sections. The new jointless pipe-within-a-pipe must fit tightly against the old pipe wall and consolidate all disconnected sections into a single continuous conduit.
- B. The wetout tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the Design thickness.
- C. The tube shall be sewn to a size that when installed will tightly fit the internal circumference and length of the original pipe with minimal shrinkage, in such a way as to minimize water migration (tracking) between the liner and the host pipe. Allowance should be made for circumferential stretching during inversion, and longitudinal stretching during pull in. Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be utilized.
- D. The minimum tube length shall be that deemed necessary by the CONTRACTOR to effectively span the distance between the access points and to facilitate a good, "non-tracking" seal. The CONTRACTOR shall verify the lengths in the field before cutting liner to length and otherwise preparing it for installation.
- E. The outside layer of the tube (before wetout) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wetout) procedure.
- F. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
- G. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
- H. Seams in the tube shall be stronger than the unseamed felt.
- I. The outside of the tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.
- J. The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216 and ASTM F1743, the physical properties herein, and those which are to be utilized in the Design of the CIPP for this project. The resin shall produce CIPP which will comply with the structural and chemical resistance requirements of this specification.

- K. The finished pipe in place shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage. Resin shall be in contact with the original mainline and the impermeable membrane shall be on the interior to be exposed to the wastewater flow. All constituent materials will be suitable for service in the environment intended. The final product will not deteriorate, corrode or lose structural strength that will reduce the projected product life. In industrial areas a liner system using epoxy vinyl ester resin shall be utilized and a polyester resin may be used in non-industrial areas. The OWNER shall determine the type of appropriate resin to be utilized for each line segment.
- L. The CIPP shall be designed as per ASTM F1216, Appendix X1. The CIPP design shall assume no bonding to the original pipe wall. The structural performance of the finished pipe must be adequate to accommodate all anticipated loads throughout its design life.
- M. The CIPP must have a minimum design life of fifty (50) years. The minimum design life may be documented by submitting life estimates by national and/or international authorities or specifying agencies. Otherwise, long-term testing and long-term in-service results (minimum ten (10) years) may be used, with the results extrapolated to fifty (50) years.
- N. The CONTRACTOR must have performed long-term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (tube and resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.
- O. The minimum required structural CIPP wall thickness shall be based on the physical and structural properties described herein and in accordance with the design equations in the appendix of ASTM F 1216, and the following design parameters:

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design <i>(as determined by Long-Term tests described in paragraph 2.02.B)</i>	50 %
Ovality*	2 %
Water Table = Grade Elevation	ft.
Soil Depth (above crown)*	ft.
Soil Modulus	700 psi
Soil Density	120 pcf
Live Load	One H20 passing truck
Design Condition	Fully deteriorated
*Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values.	

- P. The lining manufacturer shall submit to the OWNER for review complete design calculations for the liner, signed and sealed by a Professional Engineer registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 700, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.

- Q. As part of the design calculation submittal, the lining manufacturer shall submit descriptions of sampling, preparation, curing, and testing procedures; liner repair methods and materials; and a typical schedule for "wet out" of the liner together with a typical insertion and curing schedule.
- R. As part of the design calculation submittal, the lining manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be at five degree Fahrenheit increments ranging from 70 degrees F to 100 degrees F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner. This information shall be submitted in a timely fashion prior to the preconstruction conference so that the OWNER may set procedures for dealing with such an instance caused by construction delays.
- S. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.
- T. Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.
- U. Liner shall be neither accepted nor installed until design calculations are acceptable to the OWNER. Liner shall be as manufactured by Insituform Technologies, Inc., or approved equal.

2.02 STRUCTURAL REQUIREMENTS FOR MAIN LINES

- A. Since the pipe strength is related to the uniformity and density of the pipe wall, only resin vacuum impregnation will be allowed. Resin impregnation without vacuum entraps air and creates voids which weaken the pipe wall. If reinforcing materials (fiberglass, etc.) are used, the reinforcing material must be fully encapsulated within the resin to assure that the reinforcement is not exposed, either to the inside of the pipe or at the interface of the CIPP and the existing pipe.
- B. The design for the CIPP wall thickness will be based on the following strengths, unless otherwise submitted to and approved by the OWNER. Strengths in excess of these values will require documentation consisting of test results for recent installations in which 100 percent of samples tested exceeded the values claimed (minimum 3 projects with minimum 5 samples per project).

<u>Property</u>	<u>Test Method</u>	<u>Cured Composite per ASTM F1216</u>
Flexural Modulus of Elasticity	ASTM D-790	250,000 psi
Flexural Stress	ASTM D-790	4,500 psi

2.03 TESTING REQUIREMENTS

- A. Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.
- B. Hydraulic Capacity - Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall provide at least 100 percent of the flow capacity of the original pipe before rehabilitation. In lieu of actual measurements, calculated capacities may be derived using commonly accepted equations and values of the Manning flow coefficients (designated "n" coefficients). The original pipe material and condition at the time of reconstruction will determine the Manning coefficient used in the host pipe.
- C. CIPP Field Samples - When requested by the OWNER, the CONTRACTOR shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified herein have been achieved in previous field applications.

- D. Prior to any liner installation, the CONTRACTOR shall submit technical data sheets showing the physical and chemical properties and infrared spectrum analysis per ASTM E1252 (chemical fingerprint) of the proposed resin system as modified for the cured-in-place process. Additionally, copies of the certificates of analysis for resin used on the project must be made available to the OWNER upon request. The CONTRACTOR shall test each lot of resin used by conducting infrared spectrum analyses on field samples. These analyses shall be conducted at the CONTRACTOR's expense.
- E. The CONTRACTOR shall provide resin samples as directed by the OWNER during the duration of the project and infrared spectrography chemical fingerprints shall be run and compared to the submitted fingerprint to verify the resin used is the resin submitted for use on this project. These analyses shall be conducted at the OWNER's expense.
- F. In the case of liner installation performed under this contract, CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed.
 - 1. The CONTRACTOR shall submit a method to the OWNER, for approval, to obtain representative samples from the installed liners. These samples will be tested by the OWNER, at the OWNER's expense, to verify compliance with the installed material specifications. The CONTRACTOR shall produce these test samples when so directed by the OWNER. The OWNER reserves the right to request samples from as many as 10 percent of the liners installed, unless a pattern of failure occurs. In this case, the CONTRACTOR will be requested to provide a greater quantity of samples, up to 25 percent, at no additional cost, and the CONTRACTOR shall bear all costs of this additional testing.
 - 2. The cost for sample collection shall be included in the bid price for rehabilitation.
 - 3. Test specimens shall be marked in indelible ink with the appropriate lateral or main section, work order number, date of installation, and orientation to the top of the pipe (direction of up) so the results can be correlated to the field work performed. All test results shall use this designated labeling as a reference.
 - 4. The extraction and labeling of test specimens shall be done in the presence of the OWNER. The OWNER and CONTRACTOR shall, upon completion of sample extraction and labeling, both sign a chain-of-custody form that shall subsequently accompany the sample at all times and shall ultimately be received and signed at the testing laboratory. Test reports shall include a copy of the chain-of-custody form with all signatures to ensure that reported test results are for the correct sample.
 - 5. The flexural properties must meet or exceed the values specified herein.
 - 6. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743.
 - 7. Visual inspection of the CIPP shall be by closed-circuit television.
- G. When directed in advance by the OWNER for specific installations, the CONTRACTOR shall implement more extensive monitoring of temperatures inside the liner to verify proper curing.
 - 1. Temperature sensors shall be placed between the host pipe and the liner in the bottom of the host pipe (invert) throughout the reach to record the heating and cooling that takes place on the outside of the liner during processing. The sensors shall be spaced apart at intervals no greater than 20-feet for pipe sizes up to 15-inches in diameter, and no greater than 10-feet for pipe sizes 18-inches and larger. Additionally, sensors shall be strategically placed at points where a significant heat sink is likely to be anticipated. The monitoring of these sensors shall be by a computer which can record the temperatures at this interface throughout the processing of the cured-in-place liner utilizing a tamper-proof database. The proposed temperature sensor monitoring system and related software shall be as manufactured by ZIA Systems (www.ziasystems.com) or approved equal.

2. Prior to installing the liner in the host pipe, the temperature monitoring system's proper functioning shall be confirmed by hooking it up to the computer and seeing that the sensors are reporting their ambient temperatures. No more than two sensors in sequence can be found faulty during this test. If three or more sensors in sequence are discovered faulty, a new sensor array shall be pulled into the host pipe replacing the previously installed array, and the new array shall be again tested for its proper functioning.
3. Curing of the resin system shall be in accordance with the directions and established procedures of the cured-in-place product manufacturer with respect to the temperatures achieved and the duration of holding the liner at those temperatures. If any sensor or sensors along the reach indicates that there is a localized issue with respect to achieving proper curing per the written installation procedure, the CONTRACTOR shall address the issue immediately using previously established protocols for such an event.
4. The sensor array's database shall have an output report that identifies each sensor by its station in the reach and shows the maximum temperature achieved during the processing of the cured-in-place liner and the time sustained at or above the Manufacturer's required curing temperature at each sensor. The CONTRACTOR shall deliver to the OWNER a certified copy of the curing report output from the temperature monitoring system used in the control of the curing process, or shall provide the OWNER with access to the website where the secure report can be obtained.

PART 3 -- EXECUTION

3.01 CLEANING/SURFACE PREPARATION

- A. It shall be the responsibility of the CONTRACTOR to clean the pipeline with a high-pressure water jet and to remove all internal debris out of the pipeline.

3.02 SEWER REPAIRS

- A. Any protruding pieces of concrete, dropped joints or broken pipe shall be subjected to point repairs so that the pipe is left in a clean smooth condition in all respects ready for lining, unless otherwise jointly determined by the CONTRACTOR and the OWNER that the defect will not compromise the integrity of the liner.
- B. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning, or where additional damage would result if cleaning is attempted or continued, the CONTRACTOR shall advise the OWNER so that point repair(s) may be authorized prior to completion of cleaning.

3.03 JOINT, CRACK, ANNULAR SPACE, AND LINER END CHEMICAL SEALING

- A. Prior to cured-in-place liner installation, all active leaks of a magnitude to compromise the integrity of the liner shall be stopped using chemical grout, at no additional cost to the OWNER.
- B. Materials used on this Project shall have the following properties: react quickly to form a permanent watertight seal; resultant seal shall be flexible and immune to the effects of wet/dry cycles; non-biodegradable and immune to the effects of acids, alkalis, and organics in sewage; component packaging and mixing compatible with field conditions and worker safety; excess sealant left inside pipe shall be readily removable; and, be compatible with the CIPP liner resin system utilized. The chemical sealing materials shall be acrylic resin type and shall be furnished with activators, initiators, inhibitors and any other materials recommended by the manufacturer for a complete grout system. Sealing grout shall be furnished in liquid form in standard manufacturer's containers. Sealing grout shall be AV-100 manufactured by Avanti International, or approved equal.
- C. The CONTRACTOR shall modify his equipment as necessary to seal the leaks, however both his equipment and sealing method must meet the approval of the OWNER prior to use. Extreme caution shall be utilized during leak sealing (pressure) operations in order to avoid damaging already weakened sewer pipes. If any damage occurs, it shall be repaired at the CONTRACTOR's cost and to the satisfaction of the OWNER. Excessive pumping of grout which might plug a service lateral shall be

avoided. Any service laterals blocked by the grouting operation shall be cleared immediately by the CONTRACTOR.

3.04 FLOW CONTROL

- A. Flow control shall be exercised as required to ensure that no flowing sewage comes into contact with sections of the sewer under repair.

3.05 LINER INSTALLATION FOR MAIN LINES

- A. The pre-lining video of the prepared pipe shall be reviewed and be acceptable to the OWNER for cleanliness and smoothness before the CONTRACTOR begins to line the pipe.
- B. The CONTRACTOR shall present to the OWNER, for review, a description of his methods for avoiding liner stoppage due to conflict and friction with such points as the manhole entrance and the bend into the pipe entrance. He shall also present plans for dealing with a liner stopped by snagging within the pipe. This information shall be rendered to the OWNER in a timely fashion prior to the preconstruction conference.
- C. The CONTRACTOR shall immediately notify the OWNER of any construction delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the OWNER's discretion. The cost of such test shall be born by the CONTRACTOR and no extra compensation will be allowed. Any failure of sample tests or a lack of immediate notification of delay shall be automatic cause for rejection of that part of the work at the OWNER's discretion.
- D. The CONTRACTOR shall designate a location where the tube will be impregnated with resin prior to installation. The CONTRACTOR shall allow the OWNER to inspect the materials and the "wet-out" procedure.
- E. The CONTRACTOR shall submit construction schedules for advance approval by the OWNER. At no time will any service lateral remain inoperative for more than an 8-hour period. Any service that will be out of service for more than 8 hours will be temporarily by-passed into a mainline sanitary sewer, at the CONTRACTOR's expense.
- F. The materials and processes must be reasonably available for pre-installation, installation and post-installation inspections. Areas which require inspection include, but are not limited to, the following:
 - 1. Product materials should exhibit sufficient transparency to visually verify the quality of resin impregnation.
 - 2. Temperature sensing devices, such as thermocouples, shall be located between the existing pipe and the CIPP to ensure the quality of the cure of the wall laminate.
- G. After the inversion is complete, the CONTRACTOR shall supply a suitable heat source and water recirculation equipment to circulate heated water throughout the pipeline. The equipment shall be capable of delivering hot water throughout the pipeline to uniformly raise the water temperature to a level required to effectively cure the resin. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another such gage shall be placed between the tube and the host pipe at the termination end at or near the bottom to determine the temperatures during cure. Water temperature in the pipe during the cure period shall be as recommended by the resin manufacturer.
- H. Initial cure shall be deemed complete when the exposed portions of the tube appear to be hard and sound and the temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer and may require continuous recirculation of the water to maintain the temperature. The CONTRACTOR shall

have on hand at all times, for use by his personnel and the OWNER, a digital thermometer or other means of accurately and quickly checking the temperature of exposed portions of the liner.

- I. CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with modifications as listed herein.
 - J. Resin Impregnation: The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used. To insure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.
 - K. Tube Insertion: The wetout tube shall be positioned in the pipeline using either inversion or a pull-in method. If pulled into place, a power winch should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.
 - L. Temperature gauges shall be placed inside the tube at the invert level of each end to monitor the temperatures during the cure cycle.
 - M. Curing shall be accomplished by utilizing hot water under hydrostatic pressure in accordance with the manufacturer's recommended cure schedule.
 - N. Cooldown: The CONTRACTOR shall cool the hardened pipe to a temperature below 100 F before relieving the hydrostatic head. Cooldown may be accomplished by the introduction of cool water into the inversion standpipe to replace water being pumped out of the manhole. Care should be taken in release of static head so that vacuum will not be developed that could damage the newly installed liner.
 - O. Finish: The new pipe shall be cut off in the manhole at a suitable location. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination and lifts. A watertight seal shall be made at the inside manhole wall using extra polyester fiber felt and epoxy resin, or another method if approved by the OWNER. Pipe entries and exists shall be smooth, free of irregularities, and watertight. No visible leaks shall be present and the CONTRACTOR shall be responsible for grouting to remove leaks or fill voids between the host pipe and the liner. During the warranty period, any defects which will affect the integrity or strength of the product shall be repaired at the CONTRACTOR's expense, in a manner mutually agreed upon by the OWNER and the CONTRACTOR.
- 3.06 REINSTATEMENT OF SERVICE LATERALS, BRANCH CONNECTIONS, AND DROP MANHOLE CONNECTIONS
- A. After the pipe has been cured in place, the CONTRACTOR shall reconnect the existing service connections. This shall be done from the interior of the pipeline without excavation using a robotic cutter. Where holes are cut through the liner, they shall be neat and smooth in order to prevent blockage at the service connections. Cut-in service connections shall be opened to a minimum of 95 percent of the flow capacity of the building sewer. Cuts shall be wire-brushed to remove jagged edges. All coupons shall be recovered at the downstream manhole and removed. The CONTRACTOR shall stop all visible leaks, including at service connections as required. All reinstated service lateral connections (between the liner and the existing pipe) shall be grouted. The reinstatement of the service connections shall be a separate pay item.
 - B. It is the intent of these specifications that service laterals be reopened without excavation, utilizing a remote controlled cutting device, monitored by a video TV camera. The CONTRACTOR shall certify he has a minimum of 2 complete working cutters plus spare key components on the site before each liner

installation. No additional payment will be made for excavations for the purpose of reopening connections and the CONTRACTOR will be responsible for all costs and liability associated with such excavation and restoration work.

- C. Unless otherwise directed by the OWNER, all laterals will be reinstated. The OWNER will provide specific direction concerning any laterals that will be abandoned and will therefore not require reinstatement. The CONTRACTOR shall abandon a lateral by not reinstating the lateral only with the written consent of the OWNER.
- D. The language in this section applies equally to branch connections and drop manhole connections.

3.07 ACCEPTANCE

- A. The finished liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and the like. No pinholes, cracks, thin spots, dry spots, or other defects in the liner will be permitted. There shall be no visible infiltration through the liner or from behind the liner at manholes and service connections. Cut-ins and attachments at service connections shall be neat and smooth.
- B. Ridges or wrinkles in the installed liner shall be accepted or rejected at the sole discretion of the OWNER. If, in the opinion of the OWNER, such defects could cause structural weakening of the liner, impede the progress of a camera during internal television inspection, or encourage solids deposition and potential interruptions to flow, such defects shall be corrected at the CONTRACTOR's expense in a manner acceptable to the OWNER.

3.8 WET-OUT AND CURE REPORT

- A. The CONTRACTOR shall submit "wet out" and "cure" reports documenting the specific details of the liner's vacuum impregnation and saturation with resin and the CIPP installation of the liner. A copy of all "wet out" and "cure" records shall be made available to the OWNER upon request, and shall be turned over to the OWNER on a weekly basis and prior to request for payment. If the "wet out" and "cure" reports are not presented prior to a payment request for a repair work order, payment for the work will not be made and the request will be rejected. At a minimum, this report shall include, in addition to CONTRACTOR and Contract identification:
 1. Line identification and location
 2. Wet-out date
 3. Sample identification(s) and technician
 4. Installation (in sewer) date
 5. Host sewer pipe inside diameter
 6. Liner thickness
 7. Liner length
 8. Liner and resin batch numbers
 9. Resin type
 10. Wet out length
 11. Quantity of resin and catalyst utilized
 12. Wet out technicians
 13. Time wet out started and completed
 14. Applicable remarks
 15. Boiler and liner heating fluid pressure and temperature versus time log during cure period
 16. Cool down report

3.9 CLEANUP

- A. After the liner installation has been completed and accepted, the CONTRACTOR shall cleanup the entire project area and return the ground cover to the original or better condition. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.10 TELEVISION SURVEY

- A. Television survey, including Preconstruction Survey and Post Construction Survey, is required for all cured-in-place lining, and shall be completed within 2 weeks of liner installation.

3.11 PUBLIC NOTIFICATION

- A. The CONTRACTOR shall make every effort to maintain service usage throughout the duration of the project. In the event that a service connection will be out of service, the maximum amount of time of no service shall be 8 hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the CONTRACTOR to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The CONTRACTOR shall also provide the following:
 - 1. Whether or not an interruption in service is expected, written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the CONTRACTOR the home or business can call to discuss the project or any problems which could arise.
 - 2. Personal contact with any home or business which cannot be reconnected within the time stated in the written notice.

3.12 WARRANTY

- A. The CONTRACTOR shall warrant all work and materials installed for two years from the date of final acceptance. The date of final acceptance shall be the date that final payment is made to the CONTRACTOR. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the CONTRACTOR's expense in a manner mutually agreed by the OWNER and the CONTRACTOR.

– END OF SECTION –

Taylor, Coralee (ISD)

From: Forhat-Diaz, Vivian (Aviation) <VForhat-Diaz@miami-airport.com>
Sent: Tuesday, September 22, 2015 10:04 AM
To: Hartfield, Gary (ISD)
Cc: Cutie, Ralph (Aviation); Finol, Ana (Aviation); Johnson, Laurie (ISD); Taylor, Coralee (ISD); Menendez, Joaquin (Aviation)
Subject: Memo Requesting access to MCC 7360 for RPQ# 10045510
Attachments: RPQ# 10045510 CIPP Liner Installation Memo & Project Analysis.pdf; MDAD - Cured-In-Place Lining Spec.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning, please find attached MDAD request to access MCC 7360 for the Cured In Place Pipe (CIPP) liner installation at various MDAD locations. Please contact me if you need further information regarding this request.

Sincerely,

Vivian Forhat-Diaz, CGC, EI
Engineer 3 - Facilities Maintenance - Planning, Engineering and Construction
Miami-Dade Aviation Department
Phone: (305) 876-8311
E-mail: vforhat-diaz@miami-airport.com

