



**City of Phoenix, Arizona
Office of the City Engineer
Design and Construction Procurement**

**WS90500273
LARGE DIAMETER SANITARY SEWER REHABILITATION
GRADE 5 & 4 MANHOLES – NORTH – ZONES 3 & 4
DESIGN BID BUILD**

ADDENDUM NO. 2



ISSUE DATE: March 20, 2024

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on April 2, 2024, are amended as follows:

Q1.	Does this project require the coating subs to use the coating materials/products listed in COP supplement to MAG Section 626 or can other materials be used? The specifications refer to COP supplement to MAG Section 626, but doesn't include it, so we're trying to determine which coating to utilize.
A1.	The COP Supplement to MAG Section 626 and COP approved list of coating materials/products are hereby attached. Please note that this version of COP Supplement to MAG Section 626 and this list of approved coating materials/products are conditionally approved for this specific project only and are not to be cited or reference for other projects.
Q2.	We would like to know if this is the most current list of approved products, this MAG standard list is from 2012, we have been using our current epoxy coating on a City of Phoenix JOC for Manhole rehab and I would like to know if we need to submit and refer to these MAG Specs.
A2.	COP approved list of coating materials/products are hereby attached. Please note that this list of approved coating materials/products are conditionally approved for this specific project only and are not to be cited or reference for other projects.
Q3.	Do all pavement cuts regardless of street age and condition require slurry seal pavement treatment?
A3.	For all pavement cuts the current COP Street Pavement Cut Policy must be followed per City Code, Chapter 31, Article III, Section 31-49.1 Per the contract specifications surface restoration costs are to be included within the manhole rehabilitation bid item.

Project Contract Documents and Specifications:

Contract Documents

Item 1: General Information and Forms (attached):

- City of Phoenix Supplement to MAG Section 626 – Corrosion Protective Coating of Sanitary Sewer Manholes and Access Structures
- City of Phoenix Conditionally Approved Manhole Coating Materials/Products
- City of Phoenix Consolidated Product and Installation Warranty for Sanitary Sewer Protective Manhole Coatings for the City of Phoenix, Arizona Manhole Rehabilitation Program

Technical Specifications Zone 3 & Zone 4

Item 2: Section 01025 – Measurement and Payment

Subsection 3.8 BID ITEM NO. 8: MANHOLE REHABILITATION WITH 42-INCH DIAMETER STRUCTURAL INSERTS

DELETE: “A. This Bid Item is full compensation for all work associated with the installation of a 42-inch diameter structural insert within an existing manhole. Work includes excavation and removal of existing manhole cone; disposal of existing manhole components; extension of branch connections through the insert; and all insert components, including wall sections and cone section. This Item also includes epoxy-coating of the bench/throat and exposed concrete. Measurement shall be made from bottom of structural insert to top of the cone. Payment shall be per VERTICAL FOOT of structural insert installed.”

REPLACE WITH: “A. This Bid Item is full compensation for all work associated with the installation of a 42-inch diameter structural insert within an existing manhole. Work includes but is not limited to excavation and removal of existing manhole cone; disposal of existing manhole components; extension of branch connections through the insert; all insert components, including wall sections and cone section; epoxy-coating of the bench/throat and any exposed concrete; saw-cutting, removal, and disposal of existing pavement; surface restoration of non-paved areas to pre-construction conditions; and surface restoration of paved areas per to City of Phoenix Street Pavement Cut Policy or per the requirements of the agency with jurisdiction of the area. Measurement shall be made from the bottom of structural insert to top of the cone. Payment shall be per VERTICAL FOOT of structural insert installed.”

Item 3: Section 01025 – Measurement and Payment

Subsection 3.9 BID ITEM NO. 9: MANHOLE REHABILITATION WITH 54-INCH DIAMETER STRUCTURAL INSERTS

DELETE: “A. This Bid Item is full compensation for all work associated with the installation of a 54-inch diameter structural insert within an existing manhole. Work includes excavation and removal of existing manhole cone; disposal of existing manhole components; extension of branch connections through the insert; and all insert components, including wall sections and cone section. This Item also includes epoxy-coating of the bench/throat and exposed concrete. Measurement shall be made from bottom of structural insert to top of the cone. Payment shall be per VERTICAL FOOT of structural insert installed.

REPLACE WITH: “A. This Bid Item is full compensation for all work associated with the installation of a 54-inch diameter structural insert within an existing manhole. Work includes but is not limited to excavation and removal of existing manhole cone; disposal of existing manhole components; extension of branch connections through the insert; all insert components, including wall sections and cone section; epoxy-coating of the bench/throat and any exposed concrete; saw-cutting, removal, and disposal of existing pavement; surface restoration of non-paved areas to pre-construction conditions; and surface restoration of paved areas per to City of Phoenix Street Pavement Cut Policy or per the requirements

of the agency with jurisdiction of the area Measurement shall be made from bottom of structural insert to top of the cone. Payment shall be per VERTICAL FOOT of structural insert installed.”

NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the PROPOSAL P-1.

END OF ADDENDUM

SECTION 626

CORROSION PROTECTIVE COATING OF SANITARY SEWER MANHOLES AND ACCESS STRUCTURES

626.1 GENERAL:

626.1.1 Description:

(A) Scope: Unless otherwise approved by the Owner, Engineer, or as called for on the plans, all new concrete manholes and access structures constructed on 15-inch and larger diameter sanitary sewers, plus those extending to and including one upstream manhole regardless of lateral size, shall have an internal corrosion protective coating applied as specified herein. Drop manholes and force main manholes on 8-inch or larger diameter lines shall also be coated. When specified, existing sanitary sewer manholes shall be repaired as necessary and similarly coated. For this document, the terms manhole and access structure will be used interchangeably.

(B) Requirements:

- (1) The Contractor shall furnish all labor, materials, and equipment required to clean, repair (if necessary), and coat the manholes.
- (2) The Contractor shall comply with the local authority(ies) and all Occupational Safety and Health Administration (OSHA) requirements for confined space entry.
- (3) All materials specified by name brand or manufacturer shall be delivered unopened to the job site in original containers.
- (4) All safety precautions recommended by the manufacturer in printed instructions or special bulletins shall be obtained and followed. Safety data sheets (SDS) shall be kept on-site.
- (5) For existing manholes, application of coating shall be carried out after all required cleaning, surface preparation, and repairs to cone, walls, pipe penetrations, bench, and invert are completed and meet all required Quality Assurance/Quality Control (QA/QC) inspections and tests.
- (6) The Contractor shall ensure that any underlayment products, including repair materials, fillers, and primers, are compatible with the specified coating product.
- (7) The Contractor's coating applicator shall be certified by the coating and underlayment material manufacturers and properly trained for applying the manufacturer's coating and underlayment products. This certification and training requirement applies to both the applicator firm and individually to all of the firm's field personnel who will be directly involved with the application of the underlayment and/or coating products.

626.1.2 Warranty:

(A) Standardization: Materials and supplies provided shall be the standard products of manufacturers as approved by the Owner and specified by the Engineer. The standard products of manufacturers other than those specified shall be reviewed by the Engineer and approved by the Owner.

(B) Warranty:

- (1) The Contractor shall provide a non-prorated five-year warranty for all materials and the installation of protective coatings or systems applied to sanitary sewer manholes and/or access structures. If the protective coating fails within five years from the date of substantial completion and Letter of Acceptance by the Owner, the Contractor will repair or replace the defective coating at no cost to the Owner, including all materials and labor. The repair or replacement shall be completed within 30 days of notice from the Owner.
- (2) A coating failure is defined as blistering, cracking, embrittlement, softening, peeling, pitting, or adhesion failure to the substrate. The warranty shall cover the products, installation, and workmanship of the entire coating system, including all repair materials, defect fillers, primers, and all intermediate and finish coats. The warranty shall include but is not limited to all labor, equipment, permitting, traffic control, bypass pumping, third-party quality control inspection, and installer General Conditions required to repair or replace defective or failed coatings. Any testing performed during construction, including but not limited to spark testing and adhesion testing, shall not in any way modify the warranty or relieve the Contractor from its responsibility to repair or

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replace failed coatings. Mechanical damage due to maintenance operations or ancillary work on the coated manhole or structure by others is excluded from this warranty. The Contractor will have a list of warranted structures and the Owner's GIS Manhole number for each listed structure.

- (3) The Contractor shall be the single point of contact for the Owner for all warranty issues and claims and is solely responsible to the City for the supply, administration, and execution of all repairs and replacements covered by this warranty.
- (4) The Contractor shall submit a certification letter to the Engineer documenting the effective warranty date, typically after all manholes have passed testing and after any manhole adjustments are complete for the specific project. The effective warranty date may also be a mutually agreed upon date or some other established acceptance date if otherwise directed by the Engineer or the Owner.

626.1.3 Warranty Period Inspection:

The Engineer may conduct inspections before five years following substantial completion and Letter of Acceptance of new coating work and/or repaired coating work. The Contractor shall be notified of any apparent coating failures. The Contractor shall be responsible for any coordination with the coating manufacturer on the resolution and remediation of the coating failures. Defective work or coating failures shall be repaired per specifications and to the satisfaction of the Engineer. If warranty inspections are not held, the Contractor is not relieved of responsibilities under the contract documents.

626.1.4 Submittal Information Requirements:

- (A) The Contractor shall submit the following for review and approval by the Engineer at least four weeks before commencement of fieldwork unless stated otherwise:
- Copy of the state of Arizona contractor license for the applicator/installer.
 - Certificate/documentation from the coating system manufacturer that the applicator/installer firm is a certified/approved installer of the coating system.
 - Description of coating system manufacturer training/certification program as completed by applicator/installer as a firm.
 - Description of coating system manufacturer training/certification program as completed by individual employees of the applicator/installer participating in the field installation of the coating system.
 - List of Individual employees of the applicator/installer assigned to the project, their roles/responsibilities, and proof of completion of coating system manufacturer certification/training/recertification for each employee within two years of commencement of the project. Proof of certification/training/recertification is required for all individuals directly involved in the surface preparation and/or application of the coating product(s). This shall include the certified applicator, the superintendent, the foreman, and workmen who perform surface cleaning, patching, and underlayment, and workmen who mix, apply, and test the protective coating.
 - Applicator/installer QA/QC plan, to include, at minimum, the level of involvement of the coating system manufacturer's representatives; documentation of compliance to the manufacturer's product storage, mixing, surface preparation, and application requirements; and quality control testing requirements and methodology.
 - Project reference/installation list for the installer/applicator for the coating system for the past five years with owner contact information.
 - Coating system technical product submittal includes, at minimum, manufacturer information, product data sheets, mechanical/structural properties per ASTM testing, acid and chemical resistance testing results, and SDSs. The Technical Product Submittal shall include repair materials, underlayments/primers, and finish coat materials.
 - Coating system manufacturer-approved product application plan and requirements shall include, but not be limited to, product storage requirements, maximum storage life, mixing and proportioning requirements (as applicable), substrate repair and surface preparation requirements, manhole environmental condition requirements for application, the application film thickness of underlayment and finish coat(s), and required curing time.
 - Manufacturer representative verification of compliance to coating system application plan.
 - Five-year Warranty Letter/Statement covering both product and installation, including a list of asset IDs and Owner

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location IDs covered by the warranty (at substantial completion).

- Sample of finished product, representative of finished color and texture.
- Detailed project schedule.
- Flow bypass plan(s) (as applicable).
- Copies of federal, state, and local permits and agreements (as applicable).
- Contractor Health and Safety Plan (for information only).
- Pre-construction photos/videos of existing site conditions.
- Post-construction photos/videos of existing site conditions (at substantial completion).

626.2 PRODUCTS:

626.2.1 Coating Material:

- (A) Approved Materials: The coating material shall be an Owner-approved product or system.
- (B) Dry film thickness of epoxy/polymer coatings shall be a minimum of 1/8-inch (125 mils) thick, or per the manufacturer's recommendation, whichever is greater.
- (C) Cured underlayment thickness shall equal or exceed the minimum thickness recommended by the manufacturer but shall provide a uniform finished surface for the surface coating application.
- (D) An underlayment process and material recommended by the manufacturer shall be used to repair and reprofile corroded areas of manhole surfaces. Manhole surfaces shall be cleaned and prepared per the manufacturer's recommendations and requirements of this document before applying any underlayment and coating. The Engineer may require a separate adhesion pull test to verify the integrity of any underlayment repairs.

626.3 EXECUTION:

626.3.1 Manhole

Cleaning:

- (A) Cleaning shall remove all sediment, rocks, debris, roots, grease accumulations, and obstructions from the manholes. Cleaning the manhole walls, bench, and channel shall remove all grease, scale encrustation, and loose mortar so that no foreign intrusion shall cause imperfections in the coating. Cleaning methods shall include high-pressure water jetting, dry or wet abrasive blasting, mechanical abrading, or other methods approved by the Engineer.
- (B) The Contractor shall prepare concrete surfaces per NACE No. 6/SSPC-SP13 Joint Preparation Surface Standards and ICRI Technical Guidelines. The Contractor shall use abrasive blasting, high-pressure water jetting, or mechanical abrading to remove all laitance, curing compounds, hardeners, sealers, and other contaminants from the concrete surface. A minimum ICRI-CSP 5 surface profile shall be provided before applying the coating. The Contractor shall also be responsible for any additional surface preparation as the coating system manufacturer requires. Where additional preparation is required, the Contractor shall provide all labor materials and equipment as necessary at no additional cost to the Owner.
- (C) The surface must be clean before the coating system's installation. Excess water shall be blown from the surface using compressed air equipment with oil-trapping filters. Suitable heaters shall be used as needed to produce a dry surface condition. The surface shall be vacuumed to ensure that loose particles are not present.
- (D) No sediment or debris from the cleaning operations is allowed in the sewer. Any sedimentation deposited into the sewer system, as determined by the Engineer, shall be removed at no cost to the Agency.

626.3.2 Coating Installation and Repair:

- (A) With the Engineer's approval, new manholes may have corrosion coating applied at the manhole manufacturer's facility. Still, all final acceptance testing shall be performed in the field following the installation of the manhole.

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- (B) If a new manhole is coated at the manufacturer's facility, all joints will require sealing and coating in the field after manhole assembly. After the joint is assembled in the field, the Contractor shall prepare the coated surface above and below the joint to receive the protective coating per the manufacturer's recommendations. Typically, a light abrasion blast to 2 inches above and below the joint will clean the surface and give the coating a suitable surface to adhere to.
- (C) If the new manhole is coated at the manufacturer's facility, coating of joints, concrete adjustment rings, bench, and invert, and any necessary repairs to barrel or cone shall be performed in the field after successful leakage testing per Section 611.
- (D) New manholes that do not have corrosion coating applied at the manhole manufacturer's facility shall be fully coated in the field, including barrels, cones, joints, concrete adjustment rings, and bench, and invert after successful leakage testing per Section 611.
- (E) Where specified for corrosion coating, existing manholes shall be prepared per these specifications and the manufacturer's recommendations. Weak and deleterious material shall be removed down to the sound substrate. Repairs shall be made with the coating manufacturer's recommended underlayment. The Contractor shall verify that the atmospheric conditions, including the ambient and substrate temperatures, are within the coating manufacturer's requirements for application. If the atmospheric conditions are unsuitable, the Contractor shall, with the approval of the Engineer, either delay the coating application or take appropriate steps to bring the conditions to within requirements. The coating shall be applied to barrels, cones, joints, concrete adjustment rings, and bench and invert. If flows cannot be bypassed or diverted with a flow-through plug, the Engineer may waive coating of invert.
- (F) If the frame and cover of an existing coated manhole are adjusted in the field, the existing or added concrete adjustment rings shall be coated or have coating repaired as necessary per the manufacturer's recommendations.

626.3.3 Inspection Milestones

The Contractor shall inform the Owner of its progress in rehabilitating each manhole. At each manhole, the Owner may inspect the work after each milestone listed below before the Contractor shall commence work on the next milestone.

- (1) Completion of required cleaning and surface preparation activities.
- (2) Completion of all void-filling activities and underlayment application before surface coating application, with the associated adhesion testing of the underlayment layer.
- (3) Testing the pH of the surface following cleaning and void-filling underlayment activities before surface coating application.
- (4) Completion of the surface coating installation before testing.
- (5) Adhesion/bond testing of the finished coating system.
- (6) Holiday spark testing of the final surface coating.

Following final clean-up and inspection, the Contractor shall digitally prepare and submit a table documenting the testing results that include, at a minimum, the GIS manhole number, pull test locations with corresponding test results, and spark test pass/fail results.

626.3.4 Inspection and Testing Requirements:

- (A) The Contractor shall give the Engineer at least two business days advance notice before any surface preparation work, underlayment application work, coating application work, or testing.
- (B) All work and testing shall be performed in the presence of the Engineer or a designated representative of the Engineer unless the Engineer has granted prior approval to perform portions of the work in their absence.
- (C) An independent testing agency or laboratory approved by the Engineer may witness the acceptance for holiday and adhesion testing. Documentation shall be per the Engineer's requirements. The Cost of this inspection and testing shall be the Contractor's responsibility.
- (D) Additional illumination, scaffolding, and confined space entry equipment and support shall be provided by the Contractor as necessary to facilitate inspection by the Engineer or the Engineer's representative and/or testing agency when requested at no additional cost to the Agency.

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- (E) The Contractor shall furnish appropriate equipment and supplies for pH testing, holiday testing, dry and wet film thickness testing, and coating adhesion testing. The Contractor shall provide trained personnel for performing required acceptance testing, including the operation of holiday detection devices.
- (F) Holiday testing equipment and procedures shall be performed per NACE *SP0-188 Discontinuity (Holiday) Testing of New Protective Coatings on Substrates*. Areas containing holidays shall be marked, repaired, re-coated, and re-tested per the coating manufacturer's printed instructions. High-voltage pulse-type holiday detectors shall be adjusted to operate at the voltage required to cause spark jumps across air gaps equal to twice the specified coating thickness. The minimum applied voltage for 125 mils coating shall be 12,500 volts or at a setting as the coating manufacturer requires. The inspection equipment shall be in good working order and annually certified by the equipment manufacturer. Certificates of calibration shall be provided to the Engineer upon request.
- (G) The Contractor shall report the wet film thickness measurement to the Engineer. The information shall be presented after underlayment top coating operations are completed and shall state the number of manufacturer's product units used and the total square footage of surface area covered. The Engineer shall have the option of requiring the Contractor to document the number of units (coating materials) on hand before and after coating operations to verify the actual minimum dry film thickness applied. All film thicknesses not meeting the required minimums will be re-coated per the manufacturer's recommendations to the required minimum 125 mils thickness.
- (H) The Contractor shall perform adhesion tests on 30% of the manholes coated on any project (at least one manhole if 30% is less than 1.0). Adhesion tests shall conform to ASTM D7234, and the minimum pull-off strength shall be 200 PSI on concrete and 100 PSI on brick. Some portion of the substrate shall be adhered to the coating and dolly. A minimum pull-off strength of 150 PSI on concrete will be acceptable if the substrate is attached to the coating and dolly on more than Yi the area of the dolly. Fifty mm dollies shall be used for adhesion testing.
- (I) Adhesion tests shall be required at a minimum of three underlayment adhesion tests and three finished coating system adhesion tests per manhole tested.
- (J) For each manhole tested, one adhesion test will be performed on the cone, wall, and bench. The Owner or Owner's representative shall select specific test locations within each manhole. The Owner or Owner's representative shall be present to observe all adhesion testing.
- (K) The Contractor shall measure the coating thickness on the three adhesion test dollies and report the average measurement to verify the applied coating thickness.
- (L) In the event of a failure, the Engineer and Contractor shall determine the limits of failure through additional investigation, sounding, and pull tests. Failed areas shall be removed and repaired per these specifications and the manufacturer's recommendations. The Repaired area(s) shall be re-tested per these requirements. The Engineer shall be allowed to increase the testing frequency depending on the number or percentage of failed test results.
- (M) The pH of the surface of the manhole wall shall be tested per ASTM D4262 and reported.

626.4 MEASUREMENT:

Measurements shall be per the square foot of manhole wall coated or per each treated manhole as required by the contract documents.

626.5 PAYMENT:

If required, payment shall be made at the agreed-upon unit price. It shall consider total compensation for cleaning, surface preparation materials, application, testing, and any incidentals in conformance with the plans and specifications.

-End of Section

WS90500273
LARGE DIAMETER SANITARY SEWER REHABILITATION
GRADE 5 & 4 MANHOLES – NORTH – ZONES 3 & 4

CONDITIONALLY APPROVED LIST OF MANHOLE COATING PRODUCTS

Conditionally Approved Manhole Coating Products:

- Sauereisen SewerGard 210T
- Environmental Coatings SewerShield 100
- PPG/Raven 405
- Tnemec/Epoxytec CPP Sprayline
- Vortex/Quadex Structure Guard
- Sherwin Williams Dura-plate 6100
- Vortex/Quadex GeoKrete

NOTE: This list of approved manhole coating materials/products is conditionally approved only for the above referenced project and should not be cited or referenced for other projects.



City of Phoenix

WATER SERVICES DEPARTMENT
Quality Reliability Value

CONSOLIDATED PRODUCT AND INSTALLATION WARRANTY FOR SANITARY SEWER PROTECTIVE MANHOLE COATINGS FOR THE CITY OF PHOENIX, ARIZONA MANHOLE REHABILITATION PROGRAM

August 2022

For the Manhole Rehabilitation Program, **(Name of Certified Applicator)** provides this non-prorated five (5) year warranty for all materials and installation of **(Name of Coating Product or System)** applied by **(Name of Certified Applicator)** to sanitary sewer manholes and/or structures owned and/or operated by the City of Phoenix, Arizona (City). If the protective coating fails within five (5) years from the date of substantial completion and Letter of Acceptance by the City, **(Name of Certified Applicator)** will repair or replace the defective coating at no cost to the City. The repair or replacement will be completed within 30 days of notice from the City.

A coating failure is defined as blistering, cracking, embrittlement, softening, peeling, pitting, or adhesion failure to the substrate. This warranty covers the products, installation, and workmanship of the entire coating system, including all repair materials, defect fillers, primers, and all intermediate and finish coats. This warranty includes but is not limited to all labor, equipment, permitting, traffic control, bypass pumping, third party quality control inspection, and installer General Conditions required to repair or replace defective or failed coatings. Any testing performed during construction, including but not limited to spark testing and adhesion testing, shall not in any way modify this warranty or relieve **(Name of Certified Applicator)** from its responsibility to repair or replace failed coatings. Mechanical damage due to maintenance operations or ancillary work on the coated manhole or structure by others is excluded from this warranty. **(Name of Certified Applicator)** will have a list of warranted structures and COM GIS MH number for each listed structure. **(Name of Certified Applicator)** shall be the single point of contact for the City and/or its General Contractor (as applicable) for all warranty issues and claims and is solely responsible to the City for the supply, administration, and execution of all repairs and replacements covered by this warranty.

The **(Name of Coating Manufacturer)** products covered by this warranty are as follows:

1. **(Coating Product)**
2. **(Primer)**
3. **(Repair Materials)**
4. **(etc.)**

(Name of Authorized Signatory for Certified Applicator)

(Title)

(Company)