

**SPECIAL SPECIFICATION**  
**STRUCTURE (MANHOLE) REHABILITATION**

**100.1 Description**

This Item shall govern approved methods and materials for the coating and rehabilitation of deteriorated brick and concrete structures by spray-application of a monolithic 100% solids, rigid, ultra high-build, polyurethane lining system, and, if needed, in combination with a high strength, cementitious liner to eliminate infiltration, provide corrosion protection, repair voids and enhance structural integrity. These structures include, but are not limited to manholes, junction boxes, wet wells, lift stations and pump stations and WWTP structures.

**100.2 Product and Manufacturer Qualification Requirements**

Since sewer products are intended to have a 50 year design life, and in order to minimize the Owner's risk, only proven products with substantial successful long term track records will be allowed. At a minimum, products and installers must meet all of the following criteria to be deemed commercially acceptable:

- A. For a Product to be considered commercially acceptable, the product must have a minimum of two (2) million square feet and a ten (10) year history of successful wastewater collection system installations in the United States. In addition, products must provide Third Party Test Results supporting the long-term performance and structural strength of the product and such data shall be satisfactory to the Owner. No product will be allowed without Independent Third Party Testing verification.
- B. For an installing Contractor to be considered commercially acceptable, the installer must satisfy all insurance, financial and bonding requirements for the Owner. The Contractor must have a certification from the manufacturer as a licensed and fully trained installer of the product. The installer must also have a minimum of one (1) million square feet of successful wastewater collection system installations on underground concrete/masonry structures and ten (10) years of rehabilitation experience.

**100.3 References**

This specification references the American Society for Testing and Materials (ASTM) standards and specifications, which are made a part hereof by such reference and shall be the latest edition and revision thereof.

D-543	Test Methods for Resistance of Plastics to Chemical Reagents
D-638	Tensile Properties of Plastics
D-695	Compressive Properties of Rigid Plastics
D-790	Flexural Properties of Unreinforced and Reinforced Plastics
D-4541	Pull-off Strength of Coatings Using a Portable Adhesion Tester (steel)
D-7234	Pull-off Strength of Coatings Using a Portable Adhesion Tester (concrete)
D-2584	Volatile Matter Content
D-2240	Durometer Hardness, Type O
D-2990	Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
C-109	Compressive Strength of Hydraulic Cement Mortars
F-1216-09	Appendices X1-X7
Additional Standards	
	Mannings "n" Determination
	Creep Test for Long Term Properties
	APS Standard – Porosity Test Protocol

**100.4 Submittals**

- A. Product
  - 1. Technical data sheets showing the physical and chemical properties.

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2. Material Safety Data Sheets (MSDS).
  3. Third Party Testing results.
  4. Verification of minimum installation requirements set forth in section 100.2.A
- B. Installer
1. Verification of “certified applicator” status.
  2. Verification of minimum installation requirements set forth in section 100.2.B
- C. Manufacturer
1. Certification that the products comply with the test specification.
- D. Or Equal Product
1. In order for any Protective Coating Material (PCM) to be considered as an equal product, said product must be a 100% solids, rigid, ultra high-build, polyurethane lining system, and shall meet the minimum characteristics as measured by the applicable ASTM standards referenced in section **100.3 References** and meet the minimum physical properties referenced in section **100.4 Materials**, paragraph **A. Protective Coating Material (PCM)**, sentence **6**. Testing results must be performed and presented by a bonded accredited, ACIL or ASTM certified, third-party testing laboratory.

Note: Equal products must be approved a minimum of two (2) weeks prior to bid date. In order for a product to be considered equal to the approved products, the submitted product must provide proof of successfully passing the Los Angeles County Sanitation Districts Coating Evaluation Study and evidence from the City of Los Angeles Department of General Services Standards Division indicating the Department tested and the product “passed” SSPWC Section 210-2.3 Chemical Resistance Test. An applicator that has been trained and certified by the manufacturer must install all products.

2. Prior pre-approval is required to determine if the prospective product is considered commercially acceptable to be allowed to bid on this project. A product may be rejected as unacceptable should submittal to Owner not be received a minimum of two (2) weeks prior to bid date.

**100.5 Condition Standards and Repair Methods**

The Engineer or Owner shall categorize each structure in the following manner:

**A. New**

1. *Condition Standard:* A structure that is a new pre-cast or new poured-in-place structure or still in a like new condition. All joints are sound and tight fitting with no leakage. The structure shall be capable of passing a standard vacuum test.
2. *Repair Method:* High pressure wash and clean structure. Fill bug holes, joints, honeycombs and around pipe penetrations with a Cementitious Repair Material as needed. Apply a minimum of 125 mils thickness of a Protective Coating Material (PCM), (i.e. The SprayWall Lining System as manufactured by SprayRoq, Inc.) or pre-approved equal.

**B. Condition 1**

1. *Condition Standard:* An Existing structure that is considered structurally sound with no indications of settlement, cracking or other signs of fatigue. Infiltration or exfiltration through pre-cast joints, mortar joints, or around the pipe connections may exist and structure may be experiencing mild corrosion or deterioration.
2. *Repair Method:* High pressure wash and clean structure. Stop any infiltration using appropriate products and methods (injection grout/hydraulic cement). Fill bug holes, joints, honeycombs and around pipe penetrations with a Cementitious Repair Material as needed. Apply a minimum of 125 mils thickness of a Protective Coating Material (PCM),

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(i.e. The SprayWall Lining System as manufactured by SprayRoq, Inc.) or pre-approved equal.

**C. Condition 2**

1. *Condition Standard:* An existing structure that is exhibiting early signs of structural fatigue evidenced by minor cracks, loss of mortar or brick, moderate to moderately severe corrosion (less ½ inch in depth), minor cross sectional distortion (less than 10 %); however, it is currently supporting the soil and live load.
2. *Composite Repair Method:* High pressure wash and clean structure. Stop any infiltration using appropriate products and methods (injection grout/hydraulic cement). Apply a Cementitious Repair Material (such as Fuquay MSP) or pre-approved equal to the structure at a minimum thickness of ½ inch. Apply a minimum of 125 mils thickness of a Protective Coating Material (PCM), (i.e. The SprayWall Lining System as manufactured by SprayRoq, Inc.) or pre-approved equal.
3. *Structural Protective Coating Repair Method:* High pressure wash and clean structure. Stop any infiltration using appropriate products and methods (injection grout/hydraulic cement). Fill bug holes, joints, honeycombs and around pipe penetrations with a Cementitious Repair Material as needed. Use ASTM 1216-09, Appendices X1-X7 to determine the thickness of a Protective Coating Material (PCM), (i.e. The SprayWall Lining System as manufactured by SprayRoq, Inc. or pre-approved equal) to apply. Apply PCM according to manufacturer recommendations.

**D. Condition 3**

1. *Condition Standard:* An existing structure that is exhibiting severe structural fatigue and collapse is eminent. Conditions indicating this degree of deterioration may include very severe corrosion (loss of original profile of one inch or greater), cross sectional distortion beyond 10 percent, exposed reinforcing steel, loose or missing bricks, missing mortar, or large sections of the structure that are gone completely.
2. *Repair Method:* Pressure wash and clean structure. Fill missing sections and voids with brick and/or a Cementitious Repair Material as necessary. Stop any infiltration using appropriate products and methods (i.e. hydraulic cement and/or injection of chemical grout). Apply a Cementitious Repair Material (such as Fuquay MSP) or pre-approved equal to the structure at a minimum thickness of 1 inch or in additional ½" lifts/thicknesses (i.e. additional pay item) as needed to bring structure back to original profile. Apply a minimum of 250 mils thickness of a Protective Coating Material (PCM), (i.e. The SprayWall Lining System as manufactured by SprayRoq, Inc.) or pre-approved equal.
3. *Structural Protective Coating Repair Method:* Pressure wash and clean structure. Stop any infiltration using appropriate products and methods (injection grout/hydraulic cement). Fill bug holes, joints, honeycombs and around pipe penetrations with a Cementitious Repair Material as needed. Use ASTM 1216-09, Appendices X1-X7 to determine the thickness of a Protective Coating Material (PCM), (i.e. The SprayWall Lining System as manufactured by SprayRoq, Inc. or pre-approved equal) to apply. Apply PCM according to manufacturer recommendations.

**100.6 Materials**

**A. Protective Coating Material (PCM)**

1. The PCM shall be a spray applied, ultra high-build, self-priming polyurethane resin system.
2. The PCM shall be 100% solids and VOC (Volatile Organic Compounds) free.
3. The PCM shall have the ability to reinstate structural integrity, provide infiltration control, and supply chemical resistance to the structure.
4. The PCM shall be a two component (A and B) resin system that uses a heated plural component spray system. After the components are mixed, the PCM shall gel in about 10 seconds with a "tack-free" condition after one minute.

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5. In its final state, the PCM shall be rigid and capable of being applied at any thickness in a single mobilization.
6. The physical properties of the PCM shall meet the following minimum requirements:

Flexural Modulus (short-term)	730,000 psi
Flexural Modulus (long-term)	529,000 psi
Flexural Strength	14,000 psi
Compressive Strength	19,000 psi
Tensile Strength	7,400 psi
Tensile Modulus	420,000 psi
Elongation	4% at break
Manning's "N" Factor	.009
Abrasion (Taber CS17)	17.7 mg loss
Hardness, Shore D	90
Density	87 lbs/cf
Adhesion to concrete	substrate failure

**B. Cementitious Repair Material (CRM)**

1. The CRM shall be a factory blended, rapid setting, high early strength, corrosion resistant non-shrink grout that is specifically formulated for use in the underground wastewater environment.
2. The CRM shall be capable of being trowelled or pneumatically spray applied.
3. The CRM shall be mixed with water only and applied according to manufacturer recommendations.
4. The CRM must be compatible with the Protective Coating Material that is going to be used. The CRM manufacturer must certify compatibility.
5. The physical properties of the CRM shall meet the following minimum requirements:

Compressive Strength (24 hours)	2500 psi
Compressive Strength (28 days)	8000 psi
Tensile Strength (28 days)	800 psi
Flexural Strength (28 days)	1000 psi

**C. Hydraulic Cement Material (HCM)**

1. The HCM shall be specifically designed to stop minor water infiltration and develop high-early strengths.
2. The HCM shall be capable of being hand mixed and applied in either a "wet" or "dry" state.
3. The water used to mix the HCM should be clean and free of contaminants.
4. The HCM should be formulated with calcium silicate, calcium aluminate cements, mineral fillers, and specially selected additives for set control.
5. The HCM should be used according to the manufacturer recommendations.
6. The physical properties of the HCM shall meet the following minimum requirements:

Compressive Strength (1 hour)	400 psi
Compressive Strength (24 hours)	1000 psi
Pull out Strength	14,000 lbs
Set Time	<1.0 mins

**D. Chemical Grout Material**

1. The chemical grout shall be a semi ridged injection grout designed for sealing larger volume leaks in concrete cracks and fissures.
2. The chemical grout shall be capable of filling voids, stabilize soils or gravel.
3. The chemical grout shall be a two part system (grout and accelerator) that, when it makes contact with water, is designed to set-off and cut-off gushing water. Set times must be adjustable.

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4. Once cured, the chemical grout shall become closed cell polyurethane foam that is resistant to most organic solvents, mild acids, alkali, petroleum and micro-organisms.
5. The chemical grout physical properties when cured shall meet the following minimum requirements:

Density (confined)	5.5 lbs/cu.ft
Tensile Strength	290 psi
Compressive Strength (confined)	942 psi
Toxicity	Non-Toxic
Water Absorption	<1 %

**100.7 Safety**

- A. The Contractor will be expected to comply with all City, State and federal standards. Particular attention is drawn to those safety requirements involving entry into a confined space. The Contractor shall carry out its operations in strict accordance with all OSHA and manufacturer's safety requirements.
- B. All necessary traffic control measures shall be put into place according to the Unified Traffic Control Plan.
- C. When bypass pumping or diversion plugs are used, every effort should be made to protect the public and the environment from any contamination from the sewer.

**100.8 Flow Control**

- A. The Contractor will be responsible for establishing flow control, where required, in advance of all rehabilitation jobs. For structures with small inflow and outflow pipe diameters (6" to 12"), any and all cost for flow control shall be included in the price bid for the rehabilitation process.
- B. Plugging and Blocking
  1. A sewer line plug shall be inserted into the upstream manhole and downstream manhole as necessary.
  2. The Contractor shall be held responsible for any damage caused by flooding and will take care to avoid this occurrence.
- C. By-Pass Pumping
  1. Where flow is large enough to require by-pass pumping, the Contractor will do so in accordance with current NASSCO Specifications. The Contractor shall prepare and submit one (1) Bypass Flow Control Plan that will be typically used for the project.
  2. The bypass pumping system capacity must be sized to meet all potential flows (i.e. no sanitary sewer overflows (SSO) allowed). The Contractor will be held responsible for any damage caused by flooding and will take care to avoid this occurrence. The Contractor is responsible for all installation, operation, and maintenance of the system. The Contractor must provide manpower, fuel, and necessary utilities required by the systems. Ready-use, stand-by pumping must be available and achieved by backing up pumps size for size (100% back-up capacity) in case of emergency situations, equipment malfunction, or higher than anticipated flows. The Contractor must make their own determination of flow quantities and characteristics. The Bypass Flow Control Plan and Bypass pumping operation for pipe sizes larger than 12" will be paid under a separate pay item. Bypass pumping set up and tear down shall be subsidiary to the bypass pumping operation line items.

**100.9 Installation Procedures**

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A. Traffic Control

The Contractor will coordinate with the Owner on appropriate traffic control measures and working times.

B. Confined Space Entry

Prior to man entry into any structure to be rehabilitated, proper ventilation and strict confined space OSHA regulations shall be followed. Failure to do so shall be grounds for removal from the project.

C. Surface Preparation

Proper surface preparation procedures must be followed to ensure adequate bond strength to any surface to be rehabilitated. The following steps should be taken to prepare the surface.

1. The applicator must inspect all surfaces to be rehabilitated and notify the Owner's representative of any noticeable disparities in the conditions that are different than the original assessment and designated condition.
2. All concrete that is not sound or has been damaged by chemical exposure shall be removed to sound concrete surface.
3. All contaminants, including: oils, grease, incompatible and/or damaged existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts or other contaminants, must be completely removed prior to any surface applications. Contaminant removal and surface preparation methods must be based upon the designated conditions of the substrate and the requirements of the rehabilitation products.
4. Surfaces must be cleaned and abraded to produce a sound concrete surface with adequate profile and porosity to provide a strong bond between the existing structure and the rehabilitation products.
5. Pressure water cleaning using equipment capable of 4000 psi at 5 gpm, with a zero degree rotating nozzle, shall be used to clean and free all foreign material within the manhole. It may be necessary to clean using a detergent or steam when grease or oils are present. All residues and materials resulting from the process of cleaning the structure must be captured and removed.
6. All voids, joints, cracks, pipe penetrations, bug holes, honeycombs, etc shall be repaired using an approved CRM.
7. Repair and/or rebuild benches and inverts to owner specifications using an approved CRM.

D. Water Infiltration

1. The applicator shall determine the locations where infiltration is occurring and the process to use for stopping the active flow. For small leaks, a quick setting hydraulic cement product may be used. The process is as follows:
  - a. The area should be free from all debris, loose brick, mortar, or concrete.
  - b. Small cracks should be enlarged by chipping with a hammer and chisel to facilitate filling the crack with slurry or dry material.
  - c. The product should be mixed in quantities such that placement can be made in less than one minute. Mixing may be done in a gloved hand, trowel, or any other means that is convenient.
  - d. The placement or working time is related to the amount of water used in making the mix. High water usage increases the set time, but in general, one minute should be considered maximum.
  - e. The product shall be placed in areas of active infiltration by hand or by trowel within the setting time and without further addition of water.
  - f. Repetitive applications of dry material will gradually establish a damming effect when held in place with maximum hand pressure until stiffening takes place.

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- g. Reduction of infiltration will be caused by a gradual build-up of hydrated product, which creates a barrier that is impermeable to infiltrating water. This may require multiple applications.
  - h. Once infiltration is stopped, the product should be brushed and cleaned to remove any loose material.
2. If the Applicator determines that the flow is too significant for hydraulic cement, a hydrophobic polyurethane injection chemical grout shall be used. The applicator shall follow manufacture recommendations.
- a. The applicator shall determine the location(s) of the infiltration.
  - b. Injection ports shall be drilled through the wall near the leak and filled with a packer.
  - c. Prior to mixing, both the grout and accelerator must be agitated separately before combining by vigorously shaking the containers. The applicator shall follow the manufacturer recommendation for mix ratios.
  - d. Care should be taken during the mixing. Excess acceleration will cause vigorous expansion that may be prone to shrinkage.
  - e. Before the grout is injected, it shall be tested for appropriate set-time with the actual leaking water from inside the structure.
  - f. Once the product is mixed and ready for injection, an electric airless pump shall be used to pump product through the port and behind the structure.
  - g. During injection the grout will follow the path of least resistance. Existing ground water flow is used to carry the grout to leaking locations.
  - h. When the material has stopped penetrating it will continue to expand against the confines of the crack/joint and compress within itself, forming a very dense, closed cell material stopping the leak.
  - i. For larger leaks or voids, the use of Oakum soaked in the mixed product may be used. The Oakum is forced into the crack/joint/leak using a pointed blunt object. Once exposed to the existing water, the grout will set-off and stop the leak.
  - j. Once the leak is stopped, excess grout (foam) shall be trimmed away and removed from the structure.

**E. Cementitious Repair**

- 1. Prior to repair operations, the Engineer, Owner, and/or the Applicator shall review and confirm the designated condition of the structure and agree on the appropriate repair method.
- 2. Once all active infiltration, voids, and proper surface preparation have been addressed, the installation of the CRM can begin.
- 3. Place covers over the inverts or flow lines to prevent extraneous materials from entering the pipelines.
- 4. The applicator must use approved equipment for mixing and troweling or spraying the product. The spraying machine shall consist of a progressive cavity pump and air system for low velocity spray application. Equipment should be completely self-contained with water storage and a metering system.
- 5. The product shall be mixed with water as per the manufacturer recommendations. Only enough water will be used to produce a mix consistency to allow the application of the CRM up to three inches thick in a single application without the material "sagging" or "slumping" on the vertical surface.
- 6. Factory blended bagged material shall be placed in the mixing chamber and water added when being sprayed. Prepared mix shall be discharged into a hopper and another batch prepared to occur in such a manner as to allow spraying continuously without interruption until intended thickness is achieved.
- 7. The surface shall be damp without noticeable free water droplets or running water, but totally saturated just prior to the application.
- 8. The CRM shall be applied up to one (1) inch to (3) inch thick in one pass; however, minimum total thickness shall not be less than ½ inch.

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9. The surface will then be trowelled to a relatively smooth finish. Care should be taken to not "over trowel".
10. Once the initial cure has taken place, the exposed surface area should be given a broom finish.
11. Because curing times will vary depending on thickness and ambient temperatures, a minimum curing time of 48 hours shall take place prior to installation of Protective Coating Material.
12. Prior to application of protective coating, all surfaces shall receive a final pressure water cleaning using equipment capable of 4,000 psi at 5 gpm, using a zero degree rotating nozzle. Pressure-wash the entire structure to remove the laitance and then blow dry the substrate to remove any surface moisture prior to the installation of the Protective Coating Material.
13. Prior to application of protective coating on any steel surfaces (i.e. manhole ring), all surfaces shall receive a Commercial Blast Cleaning of a minimum SSPC-SP6 / NACE No. 3, which is defined as follows:

This joint standard covers the requirements for commercial blast cleaning of unpainted or painted steel surfaces by the use of abrasives. These requirements include the end condition of the surface and materials and procedures necessary to achieve and verify the end condition. A commercial blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter, except for staining as noted. Random staining shall be limited to no more than 33 percent of each unit area of surface as defined, and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating.

**F. Protective Coating**

1. Application procedures shall conform to the recommendations of the protective coating manufacturer, including material handling, mixing, environmental controls during application, and spray equipment.
2. The intended thickness of applied materials shall be determined by the designated condition and repair method of the structure.
3. The spray equipment shall be specifically designed to accurately ratio and apply the specified PCM and shall be regularly maintained and in proper working order.
4. The resin-based, 100% solids, polyurethane liner shall be manually sprayed on to all surfaces by a trained technician who is experienced in the application of the specific PCM and has been certified by the manufacturer.
5. Appropriate personal protection equipment shall be utilized. The spray technician shall be on supplied air at all times while in the structure.
6. The structure shall be completely dry prior to PCM application. The use of a heater with a high velocity air blower may be used. An approved HCM may also be used to dry suspect areas.
7. Prior to the PCM application, a test panel shall be sprayed to inspect the quality of the product. The technician shall check the test panel for appropriate color and mixing of the components. This will also insure that all equipment is functioning properly.
8. The spray technician will begin spraying product at the bottom of the structure (benches and inverts) one side at a time. A flash coat will be sprayed to heat up the surface to increase the bonding characteristics.
9. Once the product has "tacked-off" the technician can move to the opposite side and repeat the process.
10. The trained spray technician may now spray the PCM to the required thickness.
11. The process is repeated from the bottom of the structure to the top. Although not harmful to the PCM, the use of a ventilating system or ripcord will help to minimize "dusting" or "over-spray".
12. Achieving the specified thickness during application shall be determined using a formula based on the density of the product. The fully trained technician will calculate the



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- appropriate amount of material needed to cover the intended area. A counter on the pumping system shall be used to determine the amount of product actually used.
13. Once the PCM is applied, any and all flow may be reinstated to the structure.

**100.10 Testing and Inspection**

- A. Visual- Both Cementitious and Polymer Coating  
The Engineer, Owner, or Owners Representative shall make a final visual inspection. Any deficiencies in the finish coating shall be marked and repaired according to the manufacturer recommendations.
- B. Thickness Testing- Both Cementitious and Polymer Coating  
Thickness testing shall be done by cutting coupons at random locations on a minimum of (10%) one out of every ten of the total structures coated, or as directed by the inspector. All repairs shall be made by Contractor in strict accordance with manufacturer's recommendations using the manufacturer's approved patching material to repair the structure where test coupons were taken.
- C. Holiday Detection Testing – Polymer Coating  
Contractor shall perform holiday detection testing on all surfaces coated with Approved Polymer Coating in the presence of Inspector, with test equipment appropriate for the applied coating after the coating has set hard to the touch. The spark tester shall be initially set at 100 volts per 1 mil of required coating thickness (i.e., 12,500 volts for 125 mils). Retest until no holidays are identified. All detected holidays shall be marked and repaired according to the manufacturer's recommendations.
- D. Cementitious Material Strength Testing- Cementitious Coating  
Two 2 x 2 inch sample cube shall be taken for every 10 bags of material used. Samples shall be taken from the nozzle, identified, and sent to an independent test laboratory for compression strength testing as described in ASTM C-109. All materials shall meet the cementitious material manufactures

**100.11 Warranty**

- A. The Contractor must warrant all Work against defects in materials and workmanship for a period of one year, unless otherwise noted, from the date of final acceptance of all Work contained in the project.
- B. The Contractor must repair such defects in materials or workmanship within 30 calendar days of receipt of written notice of defects.

**100.12 Approved Products**

The following products have been pre-approved for this project. Any products not listed must be submitted to the Engineer thirty days prior to the bid date with no exceptions. Timely submittal does not guarantee approval.

- 1. Protective Coating Material (PCM) --  
Protective Coating Material Patch Kit -  
SprayWall™  
SR6100  
Sprayroq, Inc.  
4707 Alton Court  
Birmingham, AL 35210
  
- 2. Cementitious Repair Material (CRM) –  
Fuquay Liner SRM™  
Fuquay Bench Mix™  
Fuquay Patch  
Fuquay, Inc  
4861 Old Hwy 81  
New Braunfels, TX 78132

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Strong Seal MS2®C  
Strong QSR  
Strong Seal® Bench Mix  
Strong Seal High Performance Mix  
The Strong Company, Inc  
4505 Emmett Sanders Road  
Pine Bluff, AR 71601

3. Chemical Grout Material

Spetec H100®  
Spetec H40®  
Spetec F1000®  
Spetec F400®  
Spetec GT1100®  
Resiplast US  
P.O. Box 308  
Cypress, TX 77410

4. Hydraulic Cement Material (HCM)

Fuquay Plug  
Fuquay, Inc  
4861 Old Hwy 81  
New Braunfels, TX 78132

Strong-Plug®  
The Strong Company, Inc  
4505 Emmett Sanders Road  
Pine Bluff, AR 71601

**100.13 Measurement and Payment**

A. Structure Rehabilitation

1. Measurement for coating and rehabilitation condition 1 shall be measured and paid for by the unit per square foot.
2. Measurement for coating and rehabilitation condition 2 shall be measured and paid for by the unit per square foot.
3. Measurement for coating and rehabilitation condition 3 shall be measured and paid for by the unit per square foot.
4. Measurement for coating and rehabilitation condition 4 shall be measured and paid for by the unit per square foot.

B. Chemical Grout application to stop active leaks shall be measured and paid by the gallon.

C. Repair/rebuild existing bench or invert work shall be subsidiary to Structure Rehabilitation.

D. Bypass Pumping, Flow Diversion, and Plugging

1. Lines up to 12" shall be considered subsidiary to Structure Rehabilitation.
2. Lines larger than 12" will be paid for by Lump Sum.

E. Hydraulic Cement application to stop minor leaks shall be subsidiary to Structure Rehabilitation.

F. All cleaning and surface preparation shall be subsidiary to Structure Rehabilitation.

END