CONSTRUCTION DOCUMENTS MANUAL
AND
TECHNICAL SPECIFICATIONS

LIFT STATION NO.10
REHABILITATION IMPROVEMENTS

LVWD BID NO.: 18-0627-06

ADDENDUM #2

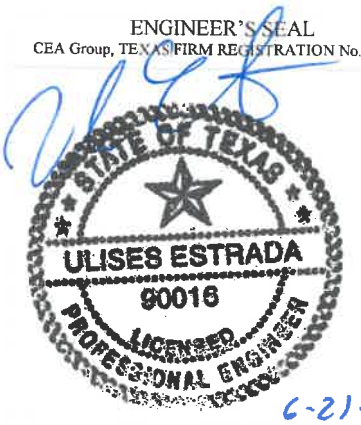
Lower Valley WATER DISTRICT

1557 FM ROAD 1110
CLINT, TEXAS 79836

BOARD MEMBERS
Rosalinda Vigil, President
Henry Trujillo, Secretary/Treasurer
David Estrada, Director
David Carrasco, Director
Gerald Grijalva, General Manager

cea group
TEXAS REGISTERED ENGINEERING FIRM F-4564
4712 Woodrow Bean, Ste.F El Paso, TX 79924
915.544.5232 | www.ceagroup.net

ENGINEER'S SEAL
CEA Group, TEXAS FIRM REGISTRATION No. F-4564



6-21-18

ADDENDUM NO. 2

LIFT STATION NO.10
REHABILITATION IMPROVEMENTS

LVWD BID NO.: 18-0627-06

Attention of all bidders is directed to the following modifications made hereby to the above Contract Documents Manual and Technical Specifications.

BIDDING REQUIREMENTS, CONTRACT FORMS AND CONDITIONS OF THE CONTRACT

A. Contract Documents Manual

REMOVE Bid No. "18-0627-03" where referenced throughout the Contract Documents Manual and **REPLACE** with "18-0627-06".

B. General Scope of Work

REMOVE the general scope of work description found in Informal Notice, Invitation to Bid and Section 00500 and **REPLACE** with the following language:

The improvements for this project consist of the rehabilitation of Lift Station No.10. In general, the work will encompass: the removal, replacement and disposal of all piping within the station, rails, valves, straps, sleeves, and fittings, etc., general site grading and removal and reinstallation of the existing pumps. Project also includes landscaping gravel and the removal and replacement of the coating system to include preparation of the concrete wet well surface. Items that are salvageable will be removed and delivered to LVWD's yard. Rehabilitation of one existing manhole structure within the site. Shoring support safety system; by-passing of the wet well and manhole; dewatering; videotaping of the project site before and after construction; and a traffic control plan, as needed.

C. Minimum Project Specific Criteria

REMOVE the Minimum Project Specific Criteria language found in Page 00100-3 and **REPLACE** with the following language:

BIDDER MUST MEET THE FOLLOWING MIMIMUM PROJECT SPECIFIC CRITERIA IN ORDER TO QUALIFY FOR AWARD OF BID:

1. The Project involves the rehabilitation of an existing manhole. Bidder must demonstrate successful completion of at least two (2) projects with similar complexity (existing development and depth of manholes) within the past five (5) years. Copy of certification for licensed installer shall be provided with bid.

2. Project involves the removal and replacement of discharge piping, header, pumps, valves and associated equipment. Bidder must demonstrate at least two (2) project where rehabilitation work of similar scope was successfully completed within the last five (5) years.

3. Project involves a By-Pass Operation to maintain a minimum of 1,100 GPM of uninterrupted (constant) operation of wastewater collection. Bidder must demonstrate one (1) project where wastewater by-pass pumping operations (700 GPM minimum) was successfully completed within the last five (5) years.

4. Project requires the removal and repairs of the existing coating system in the wet well. Bidder must demonstrate one (1) project with successful repairing and/or removal of a similar coating system and successful coating of a similar structure within the last five (5) years. Qualifications of a Subcontractor will be acceptable.

5. The Key Personnel required for this Project are a Project Manager, a Full Time Superintendent, Full Time Foremen, a Project Scheduler, and Owners or Principals of the Bidder to be assigned to this project for the duration by the Contractor to assure a completely functional and timely completion of the project. The Project Manager and Full Time Superintendent shall have performed two (2) projects with similar complexity (existing development) within the past five (5) years. Owner reserves the right to review, approve or reject the persons listed as key personnel. Resumes of Key Personnel must be submitted with the bid and accepted by the Owner in order for Bidder to receive the Award.

D. Section 00500

REMOVE Article 7.8, on Page 00500-4, in its entire and **REPLACE** with the following Article 7.8:

7.8 Specifications Bearing the title Project Manual for the Construction of Lift Station No. 10 Rehabilitation Improvements consisting of division numbers 1 through 9.

E. Section 09900

ADD Section 09900 – Lift Station Protective Coating System into the Contract Documents included here in as Attachment B.

OTHER

1. **ADD** the Pre-Bid Meeting Minutes into the Contract Documents included here in as Attachment A.

*******Please acknowledge receipt of this Addendum on Page 1 of the Bid Form. **Not doing so may result in a disqualification of your bid.**

END OF ADDENDUM NO. 2

ATTACHMENT A

MEETING MINUTES

PRE-BID MEETING AGENDA

LIFT STATION NO.10 REHABILITATION IMPROVEMENTS
CITY OF SAN ELIZARIO, TEXAS

LOWER VALLEY WATER DISTRICT

BID NUMBER 18-0627-06

JUNE 19, 2018
03:00 P.M.

I. Introductions

A. Owner/Utility Key Personnel:

Lower Valley Water District
Gerald Grijalva, General Manager
Richie Hernandez, Chief of Staff
Ed Long, P.E., Chief Operation Technical Officer
Daniel Hernandez, Engineering
Adrian Briones, Engineering
Rosa Rivera, Purchasing Manager
Gabrielle Diaz, Purchasing Department

B. Engineer:

CEA Group
Ulises Estrada, P.E., Principal
Abel Garcia, P.E., Project Manager
Luis Guerrero, Project Engineer

C. Right of Way Owner:

City of San Elizario / County of El Paso

II. Bid Date

A. The Bid Date is schedule for June 27, 2018 at 3:00 P.M. All questions must be submitted to the LVWD in writing; otherwise, they will not be answered. Questions may be emailed to Rosa Rivera (rosar@lvwd.org) no later than June 20, 2018, 5:00 P.M. – Questions will be answered via an addendum by LVWD on June 21, 2018.

III. Project Description

The improvements for this project consist of the rehabilitation of Lift Station No.10. In general, the work will encompass: the removal, replacement and disposal of all piping within the station, rails, valves, straps, sleeves, and fittings, etc., general site grading and removal and reinstallation of the existing pumps. Project also includes landscaping gravel and the removal and replacement of the coating system to include preparation of the concrete wet well surface. Items that are salvageable will be removed and delivered to LVWD's yard. Rehabilitation of one existing manhole structure within the site. Shoring support safety system; by-passing of the wet well and manhole; dewatering; videotaping of the project site before and after construction; and a traffic control plan, as needed.

IV. Minimum Project Specific Criteria

A. Reference Page 3 of Instruction to Bidders; Section 00100.

1. The Project involves the rehabilitation of an existing manhole. Bidder must demonstrate successful completion of at least two (2) projects with similar complexity (existing development and depth of manholes) within the past five (5) years. Copy of certification for licensed installer shall be provided with bid.

2. Project involves the removal and replacement of discharge piping, header, pumps, valves and associated equipment. Bidder must demonstrate at least two (2) project where rehabilitation work of similar scope was successfully completed within the last five (5) years.

3. Project involves a By-Pass Operation to maintain a minimum of 1,100 GPM of uninterrupted (constant) operation of wastewater collection. Bidder must demonstrate one (1) project where wastewater by-pass pumping operations (700 GPM minimum) was successfully completed within the last five (5) years. – Contractor is not allowed to use existing pumps for by-pass operation.

4. Project requires the removal and repairs of the existing coating system in the wet well. Bidder must demonstrate one (1) project with successful repairing and/or removal of a similar coating system and successful coating of a similar structure within the last five (5) years. Qualifications of a Subcontractor will be acceptable.

5. The Key Personnel required for this Project are a Project Manager, a Full Time Superintendent, Full Time Foremen, a Project Scheduler, and Owners or Principals of the Bidder to be assigned to this project for the duration by the Contractor to assure a completely functional and timely completion of the project. The Project Manager and Full Time Superintendent shall have performed two (2) projects with similar complexity (existing development) within the past five (5) years. Owner reserves the right to review, approve or reject the persons listed as key personnel. Resumes of Key Personnel must be submitted with the bid and accepted by the Owner in order for Bidder to receive the Award.

V. Construction Issues

A. By-Pass System – Contractor's Responsibility – Contractors shall provide 24-hour monitoring through the duration of the by-pass operation. A by-pass plan/program shall be submitted to LVWD for review and approval.
B. Manhole Rehabilitation – Fiberglass Shell – The Contractor must be a certified/licensed installer.
C. Coating and resurfacing of concrete wall
D. Confined Spaces – Adherence to latest OSHA Requirements
E. Light Grading
F. Staging area
G. Full Time Superintendent (on site all the time).

VI. Bid Proposal Checklist

A. Signed Bid Form
B. Bid Security in the form of a Bid Bond or Certified Check
C. Certificate of Insurance Availability
D. Names and Categories (SMLB, MBE, WBE, or SBRA) of all Subcontractors and Suppliers.
E. Evidence of Good Faith Efforts
F. Statement of Nondivestment from Israel
G. Electronic version of the Bid Proposal
H. Qualification Statement and Qualifications of Key Personnel.

VII. Contract Time

A. Substantial Completion within 150 Calendar Days from **Notice to Proceed.**
B. Final Completion within 180 Calendar Days from **Notice to Proceed.**

VIII. Liquidated Damages

A. Substantial Completion - $915.00 per calendar day.
B. Final Completion - $500.00 per calendar day.

IX. Addenda

A. Addendum #1
   1. Will be issued on June 21, 2018 to address questions and share pre-bid meeting minutes.

X. Site Visit

A. Contractor is encouraged to visit site prior to bidding project. – Site visit will be scheduled for Thursday 21st, 2018 at 2:00pm.

XI. Questions

ATTACHMENT B

SECTION 09900 –LIFT STATION PROTECTIVE COATING SYSTEM

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This specification covers the work necessary to furnish and install a complete lining or rehabilitation system for sanitary sewer structures, as shown on the drawings and as specified herein. Work includes, but is not limited to, the following:

1. Stopping Leaks by repair and sealing of the concrete, invert, pipe inlets, walls, and frame of all structures to include removal of unsound materials, preparation, chemical grouting, structural lining, patching, plugging and sealing compounds.

2. Surface preparation, and installation of Structural Lining, High Strength Corrosion Protection Lining to include protection of surfaces not to be treated, touch-up, clean-up, and appurtenant work all in accordance with the requirements of the Contract Documents and this Specification.

1.02 RELATED WORK

A. Concrete in Section 03300

1.03 REFERENCED SPECIFICATOIN CODES AND STANDARDS

A. Without limiting the generality of other requirements of these specifications, all work hereunder shall conform to the applicable requirements of the referenced portions of the following documents, to the extent that the requirements therein are not in conflict with the provisions of this Section. All references and standards listed shall be the latest revisions. Joint and individual documents are referenced.

1. SSPC – The Society for Protective Coatings
40 24th Street, 6th Floor
Pittsburgh, PA 15222-4643
(412) 281-2331

2. NACE – National Association of Corrosion Engineers
P.O. Box 218340
Houston, TX 77218-8340
(281) 492-0535

a. SSPC-SP 13/NACE No. 6 Surface Preparation of Concrete
b. SSPC-TU 2/NACE 6G197 Design, Installation, and Maintenance of Coating Systems for Concrete Used in Secondary Containment
c. SSPC-SP 5/NACE No. 1, White Metal Blast Cleaning
d. SSPC-SP10/NACE No. 2, Near White Metal Blast Cleaning
e. SSPC-SP 6/NACE No. 3,Commercial Blast Cleaning
f. NACE RP0892 "Linings over Concrete for Immersion Service"
g. NACE Standard RP0591 "Coatings for Concrete Surfaces in Non-Immersion and Atmospheric Service"
h. NACE SP0188 "Discontinuity Holiday Testing of Protective Coatings".
i. NACE RP 6F-164 "Curing of Interior Tank Linings".
j. NACE RP 6F-166 "Recommended Practice for Inspection of Linings on Steel and Concrete"

3. ICRI – International Concrete Repair Institute
3166 S. River Rd., Suite 132
DesPlaines, Il 60018

(847) 827-0830

a. Technical Guideline No.03372, "Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays"
b. Technical Guideline No. 03731, "Guide for Selecting Application Methods for the Repair of Concrete Surfaces"
c. Technical Guideline No. 03730, "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion"

4. ASTM – American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
(610) 832-9585

a. ASTM E-337: Test Method for Measuring Humidity with a Psychrometer
b. ASTM D 4258 "Practice for Surface Cleaning Concrete for Coating"
c. ASTM D 4261 "Practice for Surface Cleaning Unit Masonry for Coating"
d. ASTM D 4262 "Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces"
e. ASTM D 4414 "Standard Practice for Measurement of Wet Film Thickness by Notch Gages"
f. ASTM D 4787 "Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates"

5. ACI – American Concrete Institute
Box 19150, Redford Station
Detroit, Michigan 48219
(248) 848-3700

a. ACI 350-01 "Code Requirements for Environmental Engineering Concrete Structures"
b. ACI 350.1 "Testing of Reinforced Concrete Structures for Water Tightness"
c. ACI 350.2 "Concrete Structures for Containment of Hazardous Material"
f. ACI 503 "Use of Epoxy Compounds with Concrete"
g. ACI 504 "Guide to Sealing Joints in Concrete Structures"

1.04 SUBMITTALS

A. Submit product data for each component specified including data substantiating that the proposed materials comply with specified requirements and recommendations by the manufacturer covering all materials.

B. Samples of the cured system as described in Part 3.03.D to include the following

1. Finish texture as determined by the owner or owners' authorized representative.

2. Stepped samples showing stages of multi-layer applications.

1.05 QUALITY ASSURANCE

A. Acceptable Manufacturers: The manufacturer of the specified products shall have in existence, for a minimum of three (3) years, a program of training, and technically supporting a nationally organized Approved Contractor Program. Manufacturer must provide five (5) project histories with names, dates, addresses, and phone numbers of contact persons for projects of similar scope, which have been completed at least three (3) or more years ago.

1. Submit manufacturer's representative name, address and telephone number who will be available to provide information and suggestions on the proper use of the products.

B. Single Source Supply: All products described in Part 2.01 shall be manufactured by or approved for use by the manufacturer of the sanitary sewer infrastructure linings or rehabilitation system specified herein.

C. Installer Qualifications: Engage only factory trained, approved applicators that have successfully completed applications using specified materials on projects of similar size and scope.

1. Provide (3) three references with name, address, and telephone number.

2. Provide written approval from the material manufacturer.

3. All of the contractor's jobsite personnel must be trained in the hazards associated with confined space entry. All personnel entering a confine space shall be certified for confined space entry.

D. Equipment Requirements

1. Application equipment must be approved in writing by Manufacturer's Technical Service Group

E. Substitutions

1. Manufacturers seeking approval of products other than the specified system must supply cured samples, full product information, project histories and references, technical data with specifications, MSDS and certifications regarding conformity of performance properties from an independent testing laboratory. The product being submitted for approval must meet all requirements of the performance properties specified within this specification. Compliance with the above quality assurances must be provided in written form at least fourteen (14) days before bids are received. Omission or non-conformance of any item will result in rejection of the request.

F. Pre-Installation Conference

1. The contractor, the installation sub-contractor, and the sanitary sewer infrastructure lining and rehabilitation system manufacturer's representative shall meet on site with the owner's representative. Particular emphasis shall be placed on these specifications, safety, weather conditions, surface preparation, material application, and inspection.

2. The contractor shall submit to the owner's representative any revisions or changes agreed upon, reasons thereof, and parties agreeing or disagreeing with them.

G. Substrate Conditions: Do not proceed with work until substrate preparation and tolerances have been approved by the owner's representative, sanitary sewer infrastructure lining and rehabilitation system manufacturer's representative, the approved installation sub-contractor, and the contractor.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products to the job site in manufacturer's original, unopened containers bearing manufacturer's name and label and the following information

1. Product name
2. Product description (generic product classification)
3. Manufacturer's lot number
4. Color

B. Store materials in sealed original manufacturer's containers. Store materials in a protected area out of direct sunlight. Keep containers clean and undamaged. Adhere to manufacturer's published storage temperature and shelf life recommendations. Protect all materials from freezing.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS AND MATERIALS

A. The Sanitary Sewer Infrastructure Lining or Rehabilitation System as manufactured by Sherwin-Williams, OR approved equal, will consist of, one or more systems for Stopping Leaks, Structural Lining, High Strength Corrosion Protection Lining where specified. All products are specified as the minimum standard of quality, and are manufactured or distributed by The Sherwin-Williams Company, Cleveland, Ohio (800-331-7979), OR approved equal. Additional products may consist of one or more systems for infiltration leak stoppage and concrete repair.

1. **Stopping Leaks** - Infiltration leakage of all concrete and brick structures shall be stopped by trenchless technology method of chemical grouting with polyurethane grouts. Products shall be manufactured by Avanti Grouts and shall be classified as "Hydrophobic Foam", "Hydrophilic Gel" or "Hydrophilic Foam" grouting compounds or a combination of these materials and methods as recommended by the manufacturer.

   a. Hydrophobic Polyurethane Grouts are hydrophobic polyurethanes that when mixed and makes contact with the water, is designed to fill large voids in rock fissures, gravel layers, and cracks in concrete structures and for the cut-off of gushing water.
   Product – Avanti Grouts AV-280 Hydrofoam with AV-281 Hydrocel

   b. Hydrophilic Polyurethane Gels are hydrophilic polyurethanes designed to react with water and form a water impermeable gel mass. When they come into contact with water, the grout begins to foam and gel, and depending on the temperature and amount of water present, quickly cure to a flexible, impermeable foam or gel mass unaffected by mildly corrosive environments.
   Product – Avanti Grouts AV-202 Multi-Grout

   c. Hydrophilic Polyurethane Foams are designed to form a flexible gaskets or plug in joints and cracks in concrete. When it comes into contact with water, the grout expands quickly and cures to tough. Flexible, adhesive, closed-cell, foam that is essentially unaffected by mildly corrosive environments.
   Product – Avanti Grouts AV-202 Multi-Grout

   d. Hydrophobic Polyurethane Grouts that are designed to form flexible gasket or plugs in very tight joints and hairline cracks. When they come into contact with water the grout expands and depending on temperature and the amount of accelerator used quickly cures to a tough, flexible closed cell polyurethane foam that is essentially unaffected by corrosive environments.
   Product – Avanti Grouts AV-248 Flexseal LV with AV-249 Catalyst LV

2. **Resurfacing Materials** – Designated structures shall receive an application of resurfacing compounds/repair mortar. The resurfacing compounds/repair mortars are classified as Hydraulic Cements, Microsilica Repair Mortars or Calcium Aluminate Repair Mortars. Microsilica Repair Mortars shall be designated for areas of Mild H2s content or areas to be top coated with a corrosion resistant coating or lining as shown on the drawings. Calcium Aluminate Repair Mortars shall be designated for areas of moderate H2S content or areas to be top coated with corrosion resistant coating or lining as shown on the drawings. Thickness shall be sufficient to replace lost cross section and fill voids

   a. Hydraulic Cements shall be cement based, quick setting, hydraulic cement compound which instantly stops weeping water through concrete or masonry walls and floors. They will become harder and more resistant when subjected to constant water pressure. (*Used primarily for filling large voids and stopping minor weeping water leaks)*
   A.W. Cook Cement, CEMTEC Hydraulic Cement
   Physical Properties (28 day cure)

Compressive Strength ASTM C-109	5,500 psi
Tensile Strength ASTM C-496	650 psi
Bond Strength ASTM C-882 (Modified)	880 psi
Setting Times (Gilmore) "Hot Mix"	65 seconds

   b. Rapid Cure Vertical Grade repair mortars shall be a one part, polymer modified, fast setting, silica fume, fiber reinforced mortar designed for vertical and overhead repairs from ¼" to 2" in one lift. The product may be applied by hand trowel or sprayed with a low-pressure pump. *(Used to hand place large voids, bench repair, or hand troweled structural wall linings)*
   A.W. Cook Cement, CEMTEC Silatec Rapid Cure Vertical Grade
   Physical Properties (28 day cure)

Compressive Strength ASTM C-109	6,800 psi
Flexural Strength ASTM C-293	990 psi
Bond Strength ASTM C-882 (Modified)	1,600 psi
Shrinkage ASTM C-596	0.07%
Abrasion Resistance – ¼" APCI	1
Setting Times @ 77°F	
Initial Set – 35 min	
Final Set – 50 min	

   c. Microsilica repair mortars shall be a blend of Portland cement, graded silica sand, fibers and silica fume. The mortar may be hand troweled or spray applied, usually from ½" to 1" in depth. Uses include repairing concrete walls, ceilings, lining brick or concrete manholes and lift stations, etc. Microsilica repair mortar provides an extremely dense matrix and will accept coatings at earlier ages than typical Portland cement repair products. *(Used primarily for structural wall linings)*
   A.W. Cook Cement, CEMTEC Silatec MSM
   Physical Properties (28 days cure)

Compressive Strength ASTM C-109	10,400 psi
Flexural Strength ASTM C-293	1,695 psi
Shrinkage ASTM C-596	0.00%
Freeze/Thaw ASTM C-666 100 cycles	No Effect
Bond Strength ASTM C-882 (Modified)	1,695 psi
Modulus of Elasticity ASTM C-469	4,533,333 psi
Tensile Strength ASTM C-496	750 psi

d. Calcium Aluminate repair mortars shall be a blend of quartz silica, fibers and calcium aluminate cement. They can be hand troweled or spray applied, usually from ½" to 1" in depth. Uses include repairing concrete wall and ceilings, lining brick or concrete manholes, lift stations, etc. They can be especially useful when coatings are required at early stages of cure. (Consult with coating manufacturer for specific times) *(Used primarily for structural wall linings)*
Option # 1 – A.W. Cook Cement, CEMTEC Silatec CAM
Physical Performance (28 day cure)

Compressive Strength ASTM C-109	12,800 psi
Flexural Strength ASTM C-293	1,360 psi
Shrinkage ASTM C-596	0.03%
Tensile Strength ASTM C-496	650 psi
Freeze/Thaw, 300 cycles ASTM C-666	No Effect
Bond Strength ASTM C-882 (Modified)	1,765 psi

2.02 PERFORMANCE CRITERIA

A. The High Strength Corrosion Protection Lining System shall consist of Sherwin-Williams Dura-Plate 6100 High Physical Strength Epoxy, OR approved equal. This is a 100%, high build, high strength, amine cured epoxy designed for the protection of concrete and steel in highly corrosive hydrogen sulfide (microbial induced) environments associated with wastewater applications including lift stations, digesters, aeration basins, manholes and wet wells. The application thickness shall be 100 – 125 mils DFT, when applied to concrete, masonry or structural lining surfaces. The specified film thickness shall be applied via heated, plural component, spray application in a single coat with multiple passes.

Physical Properties:

Adhesion – ASTM D7234 - >2,000 psi, Concrete Failure
Abrasion Resistance – ASTM D4060, 1,000 g, 1000 cycles, CS-17 Wheel – <90 mg loss
Compressive Strength – ASTM D695 – 15,000 psi
Dry Heat Resistance – ASTM D2485 – 300°F
Elongation Percent – ASTM D638 – 4.8%
Flexural Modulus – ASTM D790 – 590,000 psi
Flexural Strength – ASTM D790 – 11,000 psi
Hardness, Shore D – ASTM D2240 – 83
Impact Resistance – ASTM D2794 – 30 in. lbs.
Tensile Strength – ASTM D638 – 5,600 psi
Water Absorption – ASTM D570 – 0.15%
Water Vapor Transmission – ASTM D1653 – 3.0/gms/m² (24 hrs)
Chemical Resistance at 120°F
- 5% Acetic Acid
- 5% Ammonium Hydroxide
- Diesel
- 1% Ferric Chloride
- Gasoline
- 10% Hydrochloric Acid
- Kerosene
- 10% Nitric Acid
- 10% Sodium Chloride
- 25% Sodium Hydroxide
- 1% Sodium Hypochlorite
- 20% Sulfuric Acid

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. Inflow and Infiltrations

1. Active leakage of all concrete and brick structures shall be stopped by trenchless technology method of chemical grouting with polyurethane grouts. Grouts shall be installed per manufacturers directions and could include any of the hydrophilic or hydrophobic products listed or combination there of.

B. Concrete

1. The NACE/SSPC Joint Surface Preparation Standards for concrete surface preparation are incorporated in and made part of this specification. All references to SSPC SP-13/NACE No 6 designate the definitions and other requirements in these documents. The International Concrete Repair Institute (ICRI) Technical Guideline No. 0310.2R, Guide to Surface Preparation of Concrete to Receive Sealers, Coatings and Polymer Overlays shall be used to visually evaluate the concrete surface profile. Refer to Sherwin-Williams' Concrete Surface Preparation Guide.

2. Create a minimum surface profile for the system specified in accordance with the methods described in ICRI No. 0310.2R to achieve profile CSP-5 to CSP-7

3. Concrete surface defects, such as deteriorated concrete or masonry, hollow areas, bugholes, honeycombs, cracks and voids shall be filled flush and true with the specified structural lining compound in accordance with ICRI Technical Guide No 0310.2R "Guide for Selecting Application Methods for the Repair of Concrete Surfaces". Fins, trowel marks, and all protrusions or rough edges shall be removed. All active water leaks shall be stopped by use of polyurethane chemical grouting compounds.

4. Concrete Surface Repair: Surface voids and defects

   a. All surfaces shall receive a minimum of ½" thickness of the specified structural lining repair mortar.

5. Provide a clean, saturated surface dry (SSD) concrete surface with no free standing or moving water, with a minimum surface profile as defined by ICRI in accordance with 0310.2R equal to a CSP 3-5. All substrates are to be vacuumed, swept and blown down with clean, dry air to remove spent abrasive, dust and other foreign material that might interfere with the adhesion of the primer and lining.

6. Debris resulting from surface preparation and cleaning shall not be allowed to enter any water streams and shall be removed form the structure.

C. Miscellaneous Metals

1. The NACE / SSPC Joint Surface Preparation Standards for abrasive blasting approved in October 1994 are incorporated in and made a part of this specification. All references to SSPC-SP6 / NACE No. 3 and SSPC-SP10 / NACE No. 2 designate the definitions and other requirements in these documents. SSPC VIS 1-89 Visual Standard for Abrasive Blast Cleaned steel shall be used to visually evaluate the blast cleanliness.

2. Remove all oil and grease form surface by solvent cleaning per SSPC-SP1. Minimum surface preparation is SSPC-SP10 / NACE No. 2, Near White Metal Blast Cleaning. Abrasive blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2-3 mils). Prime any bare steel the same day as it is cleaned and before flash rusting occurs. Refer to Sherwin-Williams Guidelines Procedures for Surface Preparation of Metals.

   a. Inspect the surfaces to be lined. All holes in the steel surfaces or pits greater than 1/8 inch shall be repaired in accordance with the owner's repair procedures.

   b. All substrates are to be vacuumed, swept and blown down with clean, dry air to remove spent abrasive, dust and other foreign material that might interfere with the adhesion of the primer or basecoat.

   c. The maximum allowable residual salt contamination, as measured with a KTA Scat Kit or equivalent field test method, immediately prior to the application of the first coat is as follows:
      - 5 micrograms per square centimeter (50mg/m^2) most commodities up to 120°F

   d. Corrosion pits in the blasted steel shall be filled flush with the substrate using Sherwin-Williams Steel-Seam FT 910 patching and surfacing compound.

   e. Projections and lap joints on welded plates and on riveted plates to be coated shall be filled with Steel-Seam FT 910 patching and surfacing compound in order to smooth out the surface and provide for a smooth transition of the lining over the substrate.

3.02 APPLICATION

A. The contractor shall at all times maintain traffic control measures in cooperation with local police details, property owners and the municipality.

B. **By-Pass**. The contractor shall maintain sewer flows in accordance with the contract documents. Diversion/by-passing of the flow or plugging the flow of sewerage for the purposes of affecting repairs to the structure shall be the sole responsibility of the Contractor and shall be coordinated with owner. During the by-pass of the sewer flows, Contractor shall have personnel and a stand-by pump of similar size, 7 days a week and 24-hours per day, during the entire by-pass operation. Contractor will not be permitted to use existing pumps for the by-pass operation.

C. Comply with manufacturers written installation procedures and individual product data sheet application bulletins.

D. Apply materials in accordance with the following material coverage:

High Strength Corrosion Protection Lining System

Products	**Thickness (mils dft)**
Infiltration and Inflow Control	
Stop Leaks with Avanti Polyurethane Injection Grouts	As Needed
Repair/Patching and Structural Linings	
(Steel) Steel Seam FT910	As Needed
(Concrete)A.W. Cook CEMTEC Repair Mortars	½" minimum

Primer
Not required for below grade substrates (Consult Manufacturer for structures located above grade)

Corrosion Protection Coating	
Dura-Plate 6100 Epoxy	100.0-125.0
Total Targeted Thickness	100.0-125.0

3.03 INSPECTION AND TESTING

A. The Owner or Engineer may require the services of an independent testing laboratory to test the installed system.

B. All surfaces receiving any specified corrosion protection system shall be holiday tested in there entirety per NACE SP0188 @ 100 volts/mil after 24 hours cure to ensure the surface is free of all voids and defects.

C. If test results indicate noncompliance with the specification, the following corrective action may be required of the Contractor:

1. Remove non-compliant systems or components.
2. Replace system or components in (1)
3. Assume the testing expenses.

D. Minimum requirements of the corrosion protection coatings and/or lining system are that it be free of the following:

1. Uncured material
2. Inadequate thickness
3. Pinholes
4. Blisters
5. Delamination
6. Foreign matter
7. Unspecified materials

3.04 PROTECTION

A. The corrosion protection coatings and/or lining system shall be protected from damage or detrimental elements during cure and until the time of final acceptance.

PART 4 MEASUREMENT AND PAYMENT

4.01 Payment will be made for all work covered in this section at the contract Lump Sum price bid for the Lift Station as shown in the proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the Drawings and the provisions of these Specifications.

END OF SECTION