

**ADDENDUM NO. 3**

**DATE: JUNE 1, 2018**

To

**BID, CONTRACT, BONDS AND SPECIFICATIONS  
FOR CONSTRUCTING  
MINERAL SPRINGS WWTP EXPANSION TO 0.95 MGD  
FOR  
NEWNAN UTILITIES  
NEWNAN, GEORGIA**

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Bids received until 2:00 P.M., Local Time, **June 6, 2018**

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**ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY INSERTING ITS NUMBER IN THE BID FORM; FAILURE TO DO SO MAY SUBJECT BONA FIDE BIDDER TO DISQUALIFICATION. THIS ADDENDUM FORMS A PART OF THE PROJECT DOCUMENTS; IT MODIFIES THEM AS FOLLOWS:**

**SPECIFICATIONS**

<b>Section 00 41 13 BID FORM Page 8 of 10</b>	<b>Replace</b> this page of the Bid Form with the attached page to updated the quantities for <b><u>Section VIII – EXTRA WORK, IF ORDERED BY ENGINEER.</u></b>
<b>Section 09 96 35 CHEMICAL RESISTANCE COATINGS Page 1 of 18</b>	<b>Add</b> this Section 09 96 35 CHEMICAL RESISTANCE COATINGS, attached to this addenda, to the Contract Specifications.

**Section VIII - EXTRA WORK, IF ORDERED BY ENGINEER:** (To cover authorized changes in scope of lump sum work in Section I.)

Item No	Approx. Quantity	Unit	Description	Unit Price	Total Price
1.			<u>Concrete Work</u>		
a.	100	CY	Class A Concrete	\$	\$
b.	50	CY	Class C Concrete	\$	\$
c.	7	Ton	Reinforcing Steel	\$	\$
d.	500	SF	Contact Forms	\$	\$
e.	200	CY	General Excavation	\$	\$
2.	10	Ton	<u>Ductile Iron Pipe and Fittings</u> (Furnished and Installed – MJ, Restrained Joint or Flanged)	\$	\$
3.	100	CY	<u>Crushed Stone Stabilization</u> (Including Excavation and Disposal of Unsuitable Material)	\$	\$
4.			<u>Electrical Work</u>		
a.	750	LF	Number 16 STP (In Place)	\$	\$
b.	500	LF	Number 12 AWG (In Place)	\$	\$
c.	400	LF	Number 10 AWG (In Place)	\$	\$
d.	100	LF	¾" Conduit Rigid Steel (In Place)	\$	\$
e.	10	Ea	¾" 90° LB (Conduit Fitting in Place)	\$	\$

Sub-Total, Section VIII, Items 1 through 5, the total amount of: \_\_\_\_\_  
 \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

**TOTAL BASE BID**, SECTIONS I, II, III, IV, V, VI, VII, AND VIII inclusive, the amount of:  
 \_\_\_\_\_  
 \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

SECTION 09 96 35

CHEMICAL RESISTANCE COATINGS

PART 1 GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all materials, labor and equipment required to properly furnish and install protective coating systems on surfaces as required in the Contract Drawings.
- B. This section includes surface preparation and field application of a reinforced chemical resistant coating system on cast-in-place concrete and masonry surfaces as noted on the Drawings.
- C. This section includes surface preparation and field application of an unreinforced chemical resistant coating system on precast concrete surfaces as noted on the Drawings.

1.2 REFERENCES

A. ASTM International:

- 1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- 2. ASTM D4138 – Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means.
- 3. ASTM D4258 – Standard Practice for Surface Cleaning Concrete for Coating.
- 4. ASTM D4259 – Standard Practice for Abrading Concrete.
- 5. ASTM D4260 – Standard Practice for Liquid and Gelled Acid Etching of Concrete.
- 6. ASTM D4261 – Standard Practice for Surface Cleaning Concrete Masonry Units for Coating.
- 7. ASTM D4262 – Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces.
- 8. ASTM D4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- 9. ASTM D4285 – Standard Test Method for Indicating Oil or Water in Compressed Air.
- 10. ASTM D4414 – Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
- 11. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
- 12. ASTM D6237 - Standard Guide for Painting Inspectors (Concrete and Masonry Substrates).
- 13. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

B. Society for Protective Coatings (SSPC):

- 1. Guide 6, Guide for Containing Debris Generated During Paint Removal Operations
- 2. SSPC SP13 (NACE 6), Surface Preparation of Concrete

C. ICRI Guideline 310.2

D. Equipment and Coating Manufacturers' Published Instructions.

### 1.3 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

### 1.4 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on all products.

C. Samples:

1. Submit two paper chip samples, 2 x 2 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
2. The Owner shall select the colors for each area to be coated.

D. Manufacturer's Installation Instructions: Submit complete manufacturer's installation instructions including any special surface preparation procedures, and any substrate conditions requiring special attention. In case of conflict between this specification and the manufacturer's printed instructions, the manufacturer's printed instructions shall prevail.

E. Manufacturer shall submit independent third-party test results showing the coatings are highly resistant to the chemicals that are/will be utilized and stored at the sites and are suitable for use as a protective coating for concrete in containment systems.

1. Immersion, secondary containment:
  - a. Sulfuric Acid (78%)
  - b. Purate (a trademark of EKA Chemical for a 40% sodium chlorate and 8% hydrogen peroxide solution)
  - c. Chlorine dioxide solution
2. Chemical resistant coating on floors (non-immersion):
  - a. Hydrofluorosilicic Acid (23%)
  - b. Sodium Chlorite
  - c. DelPAC 2500 Polyaluminum Hydroxychlorosulfate (by Delta Chemical Corporation), a blend of 12.5% aluminum oxide, 6.6% aluminum, 1.8% sulfate and 9% chloride.
  - d. Phosphate

### 1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 – Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit data on cleaning, touch-up, and repair of coated surfaces.

### 1.6 QUALITY ASSURANCE

A. Perform Work in accordance with City standards and in a first class workmanlike manner.

- B. Only those systems and components which are judged acceptable by the Engineer shall be utilized in the work. No materials shall be delivered to the job site until the Engineer has evaluated their acceptability.
- C. Maintain one copy of printed manufacturer's instructions at the job site. Explain all instructions in detail to all personnel involved with the project chemical resistant coatings. All applied coatings shall strictly adhere to these requirements.
- D. All material shall be pure and of the best quality, shall be delivered in unbroken original containers bearing the brand and manufacturer's name, manufacturer's stock number and manufacturer's application recommendations. All coatings shall be mixed in conformity with the manufacturer's specifications and directions.
- E. Coatings and coating application accessories shall be products of a single manufacturer.
- F. A technical representative of the Coating Manufacturer shall be present to supervise the execution of the work to the extent deemed necessary by the Manufacturer to assure that all work is carried out in strict accordance with the Manufacturer's recommended practices and this specification.
  - 1. As a minimum, the Manufacturer's technical representative shall be present to review the conditions and methods prior to the start of the work, during surface preparation and a final inspection shall be performed upon substantial completion of the work.
  - 2. The cost for these services shall be the Contractor's responsibility.

#### 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing work of this section with minimum three years documented experience and approved by coating manufacturer.
  - 1. The proposed applicator shall submit a list of a minimum of five (5) completed projects of similar size and complexity to this Work.
  - 2. Include the following for each project:
    - a. Project name and location
    - b. Name of Owner
    - c. Name of Contractor
    - d. Name of Engineer
    - e. Name and type of Coating System Applied
    - f. Approximate area of coatings applied
    - g. Date of completion

#### 1.8 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 – Administrative Requirements: Pre-installation meeting.
- B. Convene a pre-installation meeting one (1) week before start of surface preparation/application of coating systems covered under this Section. Require attendance of parties directly affecting work of this Section, including Contractor, the Owner, Engineer, coating subcontractor and

chemical resistant coating manufacturer's representative to review the work to be performed under this Section.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 – Product Requirements: Product storage and handling requirements.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
  - 1. Deliver materials in original, sealed containers of the manufacturer with labels legible and intact.
  - 2. Each container shall be clearly marked or labeled to show coating identification, date of manufacture, batch number, analysis or contents, identification of all toxic substances and special instructions
- C. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing, thinning or reducing, safety and storage information.
- D. Coating Materials:
  - 1. Store in well ventilated area, as required by manufacturer's instructions.
  - 2. Store material in a suitable location and in such a manner as to comply with all safety requirements including any applicable federal, state and local rules and requirements.
  - 3. Storage shall also be in accordance with the instructions of the coating manufacturer and the requirements of the insurance underwriters.
  - 4. Flammable coatings, thinners, solvents and materials shall be stored to conform to the applicable City, County, State and Federal safety codes for flammable materials.
  - 5. Restrict storage area to coating materials and related equipment.
- E. Any material that has been determined to have exceeded the manufacturer's recommended shelf life shall be removed from the project and shall not be utilized in the completion of the work.
- F. No materials other than those formally submitted and approved shall be brought onto or stored on the project site.
  - 1. Store only acceptable Project materials on the Project site.
- G. Place any materials that may constitute a fire hazard in closed metal containers and remove daily from the Project site.

#### 1.10 SEQUENCING

- A. Section 01 10 00 – Summary: Work sequence.
- B. Sequence application to the following:
  - 1. Concrete surfaces and masonry surfaces shall be properly cured and aged according to coating manufacturer's written requirements.
  - 2. Do not apply coatings over sealants, unless chemical resistant coating manufacturer's written instructions allow or require it.

### 1.11 SAFETY

- A. Work shall be performed in a safe manner in accordance with all applicable federal, state and local codes.
- B. The Contractor shall provide all individual air supplies, air filtration or respiration equipment, protective clothing, safety showers or other supplies and equipment necessary to ensure that a safe working environment is maintained.
- C. Ventilation: The Contractor shall provide and maintain adequate ventilation during surface preparation, coating application and curing phases of the work to adequately remove dust and fumes to prevent injury to workmen, accumulation of volatile gases, or damage to existing or new equipment.
  - 1. Air circulation and exhausting of solvent vapors shall be continued until coatings have fully cured.
  - 2. It shall be the sole responsibility of the Contractor to ascertain and provide the prescribed ventilation requirements.
- D. Equipment: The Contractor shall provide explosion proof lighting, fans, pumps, sprayers, flashlights, and other required equipment in all coating and curing areas. Equipment shall be properly maintained and in good working order.
- E. Illumination: The contractor shall provide adequate illumination while work is in progress.
- F. Personal Protection Equipment: The Contractor shall provide personnel with safety clothing, climbing devices, scaffolding, work stages, respiratory equipment, and eye and face protection as required for the work.
- G. Confined Space: All work shall be performed in compliance with OSHA rules and regulations for confined space entry and comply with any State and/or local requirements, which are more restrictive than the Federal requirements.

### 1.12 WARRANTY

- A. Section 01 70 00 – Execution and Closeout Requirements: Product warranties and product bonds.
- B. Warranty period shall be for one year after completion of the project as a whole.

### 1.13 RELATED SECTIONS

- A. Drawings, General Conditions, and Supplementary Conditions of these Specifications.

## PART 2 PRODUCTS

### 2.1 COATINGS

- A. Manufacturers:
  - 1. Dudick, Inc., Streetsboro, Ohio.

2. All coatings, additives and sealants shall be the products of a single manufacturer.
3. Substitutions: Section 01 60 00 – Product Requirements.

## 2.2 REINFORCED COATING SYSTEM

A. The reinforced chemical resistant coating system shall be Protecto-Flex 100XT.

1. The first coat shall be a primer consisting of:
  - a. Primer 67.
  - b. Application minimum thickness is 3-4 mils.
2. The second coat shall be a basecoat consisting of:
  - a. Protecto-Flex 100XT.
  - b. Application minimum thickness is 1/16-inch (65 mils).
3. The third coat shall be a topcoat consisting of:
  - a. Protecto-Flex 100XT.
  - b. Application minimum thickness is 15-20 mils.
4. The fourth coat shall be a topcoat consisting of:
  - a. Protecto-Flex 100XT.
  - b. Application minimum thickness is 15-20 mils.
5. Total system thickness shall be 100 to 110 mils (WFT).

## 2.3 UNREINFORCED COATING SYSTEM

A. The chemical resistant coating system shall be Protecto-Coat 100XT.

1. The first coat shall be a primer consisting of:
  - a. Primer 67.
  - b. Application minimum thickness is 3-4 mils.
2. The second coat shall be a basecoat consisting of:
  - a. Protecto-Coat 100XT.
  - b. Application minimum thickness is 15-20 mils.
3. The third coat shall be a topcoat consisting of:
  - a. Protecto-Coat 100XT.
  - b. Application minimum thickness is 15-20 mils.
4. Total system thickness shall be 30 to 40 mils (WFT).

## 2.4 COMPONENTS

A. Coatings: Ready mixed, except field catalyzed coatings.

1. Prepare coatings as required by manufacturer.
  - a. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
  - b. For good flow and brushing properties.
  - c. Capable of drying or curing free of streaks or sags.

B. Application Data: All applicable data currently published by the coating manufacturer relating to surface preparation, coverage, film thickness, application technique, drying and overcoating times is included by reference as a part of this Section. It will be the responsibility of the Contractor to obtain and fully understand the appropriate data sheets for the coatings specified.



- C. Coatings shall be factory mixed and delivered to the site in unbroken original packages bearing the manufacturer's label.
  - 1. All coatings shall be applied in strict accordance with the manufacturer's printed specifications.
  - 2. Two component coatings shall be mixed in accordance with manufacturer's instructions.
  - 3. All two component coatings, once mixed, shall be applied within the pot life recommended by the manufacturer.
- D. Colors: The Owner will select the colors to be used on the various portions of the work.
  - 1. Provide color cards for the coatings proposed.

## 2.5 MIXING AND TINTING

- A. When possible, all coatings and other materials shall be mixed and tinted by the coating manufacturer prior to delivery to the job site.
- B. When job site mixing and/or tinting is required, the manufacturer's recommendations shall be strictly adhered to. The Contractor shall be solely responsible for the proper conduct of all on-site mixing and/or tinting.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. The Contractor shall make themselves familiar with the site and provide, install and maintain the necessary tarps, tents, covers and containment structures and shall utilize the appropriate cleaning equipment and appurtenances required to adequately contain all materials as specified herein.
- B. Adequately protect other surfaces from coating and damage. Furnish sufficient drop cloths, masking, shields and protective equipment to prevent spray or droppings from fouling surfaces not being coated and, in particular, surfaces within storage and preparation area. Repair damage as a result of inadequate or unsuitable protection.
- C. Upon completion of the work, all coating splatters or drippings shall be removed.
- D. All applied coating systems must be protected from damage during construction.

### 3.2 ENVIRONMENTAL CONDITIONS

- A. Environmental conditions which affect coating application include, but are not necessarily limited to, ambient air temperature, surface temperature, humidity, dew point and environmental cleanliness. Comply with the manufacturer's recommendations regarding environmental conditions under which coatings may be applied.
- B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by coating product manufacturer.

- C. Minimum Application Temperatures: No coating shall be applied when the ambient conditions are less than 50 degrees F; unless required otherwise by manufacturer's written instructions.
- D. Maximum Application Temperatures: No coating shall be applied when the ambient conditions are more than 110 degrees F; unless required otherwise by manufacturer's written instructions.
- E. No coating shall be applied when the temperature of the surface to be coated is below 50° F, or when the temperature is expected to drop below 50° F within six (6) hours after application of coating, or when freezing (32 degrees F) is predicted within 24 hours of application, or when the relative humidity is above 85%.
- F. Coating shall not be applied to wet, damp or frosty surfaces.
- G. Coating shall not be applied when the substrate temperature is less than 5°F above the dew point or as recommended by the coating manufacturer.
- H. No material coated inside shall be moved outside in wet or freezing weather until the coating surfaces are thoroughly dry.

### 3.3 EXAMINATION

- A. Section 01 30 00 – Administrative Requirements: Coordination and project conditions.
- B. Verify surfaces are ready to receive Work as instructed by product manufacturer.
- C. Prior to commencing surface preparation, the Contractor shall inspect all surfaces specified to receive the coating and notify the Owner, in writing, of any noticeable disparity in the site, structure or surfaces which may interfere with the work, use of materials or procedures as specified herein. Do not begin surface preparation or application until unacceptable areas or conditions have been corrected.
- D. Analysis of the existing coating that was previously applied to the chlorine dioxide containment sump has not been performed. The Owner assumes no responsibility for the actual toxic metal content or toxicity of the coating system. The Contractor is responsible for conducting appropriate testing of their own and shall comply with the applicable regulations for worker safety and health, protection of the environment and management of wastes.
- E. Concrete surfaces that have been cured with conventional curing compounds or are contaminated with form oils, grease or other contaminants that would affect the adhesion and application of the coatings must be neutralized, chemically cleaned or scarified per the manufacturers recommendations before surface preparation.
- F. Measure moisture content of surfaces. Do not apply finishes unless moisture content of surfaces is below manufacturer's recommendations.

### 3.4 PREPARATION

- A. All surfaces to be coated shall be prepared in accordance with the best practice. Surface preparation and coating shall be performed only by crews experienced in this work. All surfaces to be coated shall be thoroughly cleaned of all dirt, dust, and any foreign matter before beginning surface preparation.
- B. Where caulking is required in the areas to receive chemical resistant coatings, use Dudick Caulk 100XT. Maintain a depth to width ratio of depth 1/2 the width.
  - 1. Provide caulking at expansion joints, interior corners, and at concrete to masonry corners.
- C. The Contractor shall have the responsibility for containing, collecting and disposing of all coating particles, residues, dust, coating chips as well as all other debris generated during surface preparation performed in conjunction with the work specified herein.
- D. Coatings shall be applied by a subcontractor having the approval of the manufacturer and whose workmen have been instructed in the application of these coatings by the manufacturer.
- E. Surface Appurtenances: Remove all items not to be coated prior to preparing surfaces or applying coating.
  - 1. These items are to be carefully stored and reinstalled upon completion of work in each area.
- F. Surfaces: Correct defects and clean surfaces capable of affecting work of this section.
- G. Marks: Remove those which may bleed through surface finishes.
- H. Concrete Surfaces: All concrete shall have cured a minimum of 28 days before cleaning or coating.
- I. Concrete Surfaces: For concrete surfaces requiring a chemical resistant coating, the following surface preparation shall be employed:
  - 1. Concrete shall be prepared mechanically to remove surface laitance and provide a sound mechanical and chemical bond to the substrate. All concrete shall be prepared to the visual standard, CSP-5 from the International Concrete Repair Institute with pea gravel exposed. Oils, grease or other contaminant must be removed prior to surface preparation. Concrete must be free of curing compounds and form release agents. The prepared surface should have a nominal tensile strength of 250 psi per ASTM D4541.
  - 2. All concrete substrates must be checked for moisture prior to product application using the Plastic Sheet Test, ASTM D4263. Application of coating must begin within 12 hours after the test is completed; otherwise, a new test must be performed.
  - 3. Additional surface preparation will be required if CSP-5 grit texture with exposed pea gravel is not achieved and the surface laitance not completely removed with the first mechanical preparation procedure.

4. Mechanical preparation removes laitance: exposing honeycombs or voids beneath the surface shall be filled with Scratch Coat 300 as manufactured by Dudick.
  5. Do not use equipment to prep surface that will cause microcracking in the concrete.
- J. Precast Concrete surfaces: For precast concrete surfaces requiring a chemical resistant coating, the above surface preparation shall be adhered to as well as the following:
1. Precast manufacturer shall provide written certification/verification indicating that the manholes produced are suitable for the application of the specified coating system and they shall identify any items related to the manufacturer of the manholes that would affect the adhesion and application of the coatings.
  2. Additional surface preparation, cleaning or other work which may be required as a result shall be performed at no additional cost to the Owner
- K. Concrete Masonry Unit Surfaces Scheduled to Receive Chemical Resistant Coatings:
1. All CMU mortar joints shall have cured a minimum of 14 days before cleaning or coating.
    - a. CMU Masonry requires a mechanical wire brushing of the mortar joints to remove the loose surface mortar remnants.
    - b. Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter.
    - c. Remove oil and grease with solution of tri-sodium phosphate; rinse well and allow to dry.
    - d. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
    - e. All voids, open or hollow places in masonry shall be repaired with an epoxy patching compound.
      - 1) Patching compound shall meet coating manufacturer's recommendations.

### 3.5 BLAST CLEANING

- A. Blast cleaning equipment shall be well maintained with properly sized pots, hoses, nozzles and all support equipment required to complete the work as specified.
- B. Compressors shall be installed with the necessary oil and water separators and filters to ensure that the compressed air supply is free from moisture and oil contamination.
- C. Abrasives used in blast cleaning operations shall be new, washed, graded and free of contaminants that would interfere with the adhesion of the coating and shall not be reused unless approved by the Engineer. All expendable abrasives shall meet the minimum requirements of SSPC-AB1 and all abrasives shall meet the requirements of SSPC-AB1 - Class A for silica content (less than 1% crystalline silica)
- D. If recycled abrasives are used, appropriate equipment to clean the abrasive, including fine particle and dust removal, shall be provided.

- E. Abrasives used in blast cleaning shall be such that they will produce a surface profile as recommended by the coating manufacturer.
- F. If abrasive blasting is used as the method of surface preparation, remove all sand and debris by thoroughly vacuuming and cleaning the area.

### 3.6 HAND AND POWER TOOLS

- A. Hand and Power tools shall be well maintained and in proper working order.
- B. Discs, brushes, wheels, etc. shall be free from grease and oil and other materials that could contaminate the substrate and sized, when specified, to produce the required surface profile.

### 3.7 CONTAINMENT

- A. The work will be performed at a Water Treatment Plant in the vicinity of active treatment processes, which must remain in service during the surface preparation and coating application. The operation of the plant must not be impacted or jeopardized by the work specified herein.
- B. Power tools shall be equipped with HEPA vacuum attachments. Exhaust system shall be of sufficient strength and power to contain any dust and debris generated by the power tool removal.
- C. No open blasting will be allowed in existing/active areas at the water plant. Only self-contained blasting units equipped with necessary HEPA vacuum attachments will be allowed. Exhaust system shall be of sufficient strength and power to contain any dust and debris generated by the blast cleaning.
- D. Open air blasting will not be allowed. The Contractor shall be responsible for containing and collecting all paint, residues, dust and other debris generated during the cleaning and coating. The work area will be monitored to provide an immediate assessment of the performance of the containment methods employed by the Contractor. Under no circumstance shall emission extend beyond the work area boundaries.
- E. All work shall be performed in accordance with OSHA Safety and Health Standards 29 CFR 1910.1025. The Contractor shall submit the details of the proposed containment methods and equipment to be utilized to the Engineer for review prior to initiating cleaning operations.
- F. The Contractor is responsible for assuring the proper handling, transportation and disposal of all waste generated during the project and shall comply with the requirements of this specification and all applicable federal, state and local codes and regulations pertaining to the handling and disposal of waste. The Contractor shall comply with all applicable regulations even if the regulation is not specifically referenced herein. If a federal, state or local regulation is more restrictive than the requirements of this specification, the more restrictive requirements shall apply.

- G. Prior to beginning any cleaning operations, a representative sample of all existing coatings to be removed shall be sampled from a designated portion of the structure and sent to a laboratory for analysis.
1. Samples obtained for coatings to be removed using abrasive blast cleaning shall include the residues of the blasting operations.
  2. The paint samples and blasting residues collected shall be analyzed to determine if the residues exceed the "leachable" limits for lead, arsenic, barium, cadmium, chromium, mercury, selenium and silver as determined by the EPA's Toxicity Characteristics Leaching Procedure (TCLP).
  3. Should the results of the analysis exceed any of the EPA's maximum limits the Contractor shall apply for an EPA identification number for a generator of hazardous waste.
  4. Application and disposal of debris shall be in a manner approved by the State in which the project is located.
  5. If the results of the certified test are less than the EPA maximum limit the Contractor shall dispose of the debris generated in an approved landfill in accordance with all applicable regulations.
- H. Monitoring: To assist in determining the suitability and efficiency of the containment systems to be employed by the Contractor to contain particles and debris generated during the various exterior cleaning processes specified, the Contractor will be required to provide, maintain and analyze various methods to assess the quantity of emissions generated. These methods are described as follows:
1. Visible Emissions:
    - a. During cleaning operations, the work area shall be monitored to provide an immediate assessment of the performance of the containment methods employed by the Contractor.
    - b. Under no circumstance shall emission extend beyond the boundaries of where the coating work is being completed into general areas of the facility.
    - c. Intermittent emissions, within the property, will be monitored and subject to adjustments as required by federal, local, or state statutes or regulations.
    - d. If it is determined through monitoring or other means by the Engineer or Owner that the containment system selected and employed by the Contractor is not suitable or capable of containing the cleaning residues, debris and other materials as required, the Contractor shall, at no cost to the Owner, make use of other containment systems, equipment or measures as may be required to ensure that all materials are contained as specified.
    - e. No further work shall proceed until the necessary improvements are in place. Any remediation which may be required as the result of improper containment shall be the responsibility of the Contractor.

### 3.8 APPLICATION

- A. Follow manufacturer's written application/installation instructions and guidelines established on site by the manufacturer's technical representative.
- B. General instructions for the reinforced chemical resistant coating for concrete are as follows:
1. Concrete must always be primed to aid in the "wetting out" required for good bonding.
    - a. Mix Primer 67 Component A with Component B for 2-3 minutes and apply with a brush, roller or spray.

- b. Primer 67 should be applied at 3-4 mils.
  2. For Primer 67 applications, the basecoat should be applied over tacky primer.
    - a. Do not allow the primer to puddle.
    - b. If application is not expected over tacky primer a light sand broadcast will provide better troweling properties of the basecoat.
  3. After priming and before each additional coat, examine the surface for amine blush (oily film).
    - a. If present, remove by washing with warm water and detergent.
  4. Mix basecoat Component B to Component A.
    - a. Mix thoroughly for 1-2 minutes.
    - b. Add 20-30 lbs. of G-1 Filler per mixed gallon of basecoat resin to achieve a mortar like consistency.
    - c. The amount of G-1 Filler may vary due to working conditions and applications.
    - d. Mix well and apply a 1/16" thick basecoat to a smooth, even finish using a plasterer's trowel.
  5. Before the basecoat begins to cure, press one layer of one (1) ounce chopped strand fiberglass mat into the wet basecoat.
    - a. Lap all edges by 1 inch.
    - b. Use a stiff, natural bristle brush or roller and press the mat firmly into the basecoat, using a technique similar to hanging wall paper, to remove all air pockets and wrinkles.
    - c. Saturate the fiberglass with the basecoat resin mixture, using a short nap paint roller.
    - d. Roll vigorously until the mat has lost its white color and turns translucent.
    - e. Use enough resin to "wet out" the mat, but do not allow the saturant to puddle.
    - f. Immediately roll the wet fiberglass with a ribbed roller to remove any trapped air or wrinkles.
  6. Allow the basecoat and reinforcement application to cure overnight.
    - a. Before applying the topcoat, examine the fiberglass for any air bubbles or blisters.
    - b. If these are present, they must be cut out and repaired, using the procedure above.
    - c. All overlapped seams should be sanded flat.
    - d. The topcoat will emphasize any imperfections in the fiberglass.
    - e. If excessive blistering of the basecoat reinforcement has occurred, it may have been caused by inadequate rolling with a ribbed roller.
  7. Mix the Protecto-Flex 100XT topcoat Component A for 1-2 minutes to redisperse pigments and fillers.
    - a. Add the correct amount of Component B to Component A and mix thoroughly until a uniform color is achieved.
    - b. Apply at 15-20 mils WFT using a brush, roller or spray to a smooth even finish.
  8. On walking areas and in the sump area (horizontal surfaces only), broadcast Aluminum Oxide (1/4 lb/square foot) into the wet topcoat to complete saturation.
    - a. Once cured, remove excess with a broom.
  9. Apply a second coat of Protecto-Flex 100XT topcoat.

- a. Mix the Protecto-Flex 100XT topcoat Component A for 1-2 minutes to redisperse pigments and fillers.
  - b. Add the correct amount of Component B to Component A and mix thoroughly until a uniform color is achieved.
  - c. Apply at 15-20 mils WFT using a brush, roller or spray to a smooth even finish.
10. Airless spray is recommended using a 30:1 pump equipped with a 60 mesh filter.
- a. The nozzle should be tungsten carbide with a 0.017-0.035-inch diameter opening and a 25°- 60° fan.
  - b. Suggested output pressure (depending on temperature) is 1,500 PSI.
- C. General instructions for the unreinforced chemical resistant coating for concrete are as follows:
1. Concrete must always be primed to aid in the “wetting out” required for good bonding.
    - a. Mix Primer 67 Component A with Component B for 2-3 minutes and apply with a brush, roller or spray.
    - b. Primer 67 should be applied at 3-4 mils.
  2. For Primer 67 applications, the basecoat may be applied over tacky primer.
    - a. Do not allow the primer to puddle.
  3. After priming and before each additional coat, examine the surface for amine blush (oily film).
    - a. If present, remove by washing with warm water and detergent.
  4. It is recommended that Component A be mixed for 1-2 minutes prior to adding Component B.
  5. Mix basecoat Component B to Component A.
    - a. Mix thoroughly until a uniform color is achieved and apply with a brush, roller or spray.
    - b. Basecoat should be applied at 15-20 mils.
  6. For precast manholes only: Before the basecoat begins to cure, press one layer of one (1) ounce chopped strand fiberglass mat into the wet basecoat at each joint of the manhole.
    - a. The fiberglass mat shall be 6 inches wide, centered over the joints of the manholes.
    - b. Lap all edges by 1 inch.
    - c. Use a stiff, natural bristle brush or roller and press the mat firmly into the basecoat, using a technique similar to hanging wall paper, to remove all air pockets and wrinkles.
    - d. Saturate the fiberglass with the basecoat resin mixture, using a short nap paint roller.
    - e. Roll vigorously until the mat has lost its white color and turns translucent.
    - f. Use enough resin to “wet out” the mat, but do not allow the saturant to puddle.
    - g. Immediately roll the wet fiberglass with a ribbed roller to remove any trapped air or wrinkles.
  7. Allow the basecoat and reinforcement application to cure overnight.
    - a. Before applying the topcoat, examine the fiberglass for any air bubbles or blisters.
    - b. If these are present, they must be cut out and repaired, using the procedure above.
    - c. All overlapped seams should be sanded flat.



- d. The topcoat will emphasize any imperfections in the fiberglass.
- e. If excessive blistering of the basecoat reinforcement has occurred, it may have been caused by inadequate rolling with a ribbed roller.
- 8. Mix the Protecto-Coat 100XT topcoat Component B to Component A.
  - a. Mix thoroughly until a uniform color is achieved and apply with a brush, roller or spray.
  - b. Topcoat should be applied at 15-20 mils.
- 9. Airless spray is recommended using a 30:1 pump equipped with a 60 mesh filter or larger.
  - a. A Binks airless spray gun with a Reverse-A-Clean Tip is recommended.
  - b. The nozzle should be tungsten carbide with a 0.017-0.035-inch diameter opening and a 25°-60° fan.
  - c. Suggested output pressure (depending on temperature) is 3,000 PSI minimum.

D. Do not apply coatings to surfaces that are not dry, unless specified otherwise by the manufacturer.

E. All finishes must meet mil thickness and color requirements.

F. Coating shall be evenly spread and well brushed out so that there shall be no pinholes, drops, runs nor sagging of materials.

G. Embedded roller knaps and fibers, dry-spray and over-spray will not be acceptable.

H. Care shall be taken to ensure the application of a uniform coating and that the coating is carefully worked in formed concrete corners, masonry joints and other irregularities.

I. Coating which is found defective shall be removed and recoated.

- 1. Remove and replace, at the direction of the Engineer, any coating work found to be defective or applied under adverse conditions.

J. Apply each coat to uniform appearance.

K. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

### 3.9 FIELD QUALITY CONTROL

A. All phases of the work in connection with surface preparation and coating application shall be inspected and approved in a step-by-step procedure.

B. Inspections and testing may include, but are not limited to, surface preparation, post-cleaning cleanliness, coating application, dry film thickness film appearance, continuity and adhesion.

C. Where applicable, destructive and non-destructive instruments may be utilized to determine that the various phases of the work completed by the Contractor were performed in accordance with the specifications.

- D. Instruments which may be used, include but are not limited to, notch type wet film thickness gages, Tooke gages and adhesion testing equipment.
- E. All testing will be as required by the Engineer.
- F. All holidays and/or pinholes and millage deficiencies shall be marked and repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted in the final coating.
- G. All equipment for testing shall be provided by the Contractor and supplied by the coating manufacturer, but will be tested as required by the Engineer.
- H. Coating which is found to be defective or found to have been applied contrary to these specified conditions shall be removed and recoated.
- I. As a minimum, the following testing shall be performed:
  - 1. During coating application, the wet film thickness of each coat of paint shall be determined using a notch type wet film thickness gage in accordance with ASTM D4414. Measurements shall be taken, documented and attested to by the Contractor for submission to the Engineer and Owner.
  - 2. Visual inspection shall be made by the Engineer, Owner and manufacturer's representative of all applied coatings.
  - 3. After the coating product(s) have set in accordance with manufacturer instructions, all surfaces shall be inspected for holidays with high-voltage holiday detection equipment in accordance with NACE RPO 188-99.
    - a. All detected holidays shall be marked and repaired.
    - b. Documentation on areas tested, results and repairs made shall be provided to the Engineer and Owner by the coating manufacturer.
  - 4. A minimum of two pull tests for the first five hundred square feet of the coated surfaces in any one room within a building or any one stand alone structure (such as a manhole) shall be tested for adhesion/bond of the coating to the substrate. If both tests pass, then provide one pull test for each five hundred square feet thereafter for that room or structure.
    - a. Testing shall be conducted in accordance with ASTM D4541 and ASTM D7234 as modified herein.
    - b. The Engineer or Owner shall select areas to be tested.
    - c. Pull tests shall be performed by the applicator in the presence of the Engineer and coating manufacturer.
    - d. Pull test pass or fail shall be determined by the manufacturer's recommendations.
    - e. At the end of coating applications, the manufacturer will perform inspection and pull tests to verify proper adhesion.
    - f. The manufacturer's pull tests are destructive and shall be repaired by the Contractor.
    - g. Failure of the dolly adhesive shall be deemed a non-test and require retesting.
    - h. Should a structure fail to achieve successful pulls, additional testing shall be performed at the discretion of the Owner or Engineer.

- i. Further bond tests may be performed in areas where the required adhesion was not obtained to determine the extent of potentially deficient bonded area and repairs shall be made by the Contractor.
5. All testing shall be performed in the presence of the Engineer, Owner and the coating manufacturer's representative.
6. All deficiencies in the finished coating shall be marked and repaired in accordance with the manufacturer's recommendations and Engineer's approval.
7. All repairs and costs associated with the testing are the responsibility of the Contractor.

### 3.10 REMEDIAL AND REPAIR WORK

- A. Prior to completion of the project, the Contractor and the Coating Manufacturer Technician shall identify and repair all damaged coatings.
- B. The Contractor shall identify and repair deficiencies in the coating work to the full satisfaction of the Owner.
- C. All repair work shall be completed in accordance with the manufacturer's recommendations.
- D. Repairs, which result in an uneven coloring or poor appearance, will not be acceptable.

### 3.11 PROPERTY DAMAGE

- A. All damage or disturbance to property/equipment as a result of the performance of the work shall be repaired to equal or better than the original condition. This shall be accomplished solely at the expense of the Contractor. Under no circumstances will the Owner be held responsible for such damages or the repair or payment thereof.
- B. All damage or disturbance as a result of the performance of the work shall be corrected immediately and expeditiously.

### 3.12 CLEANING

- A. Section 01 70 00 – Execution and Closeout Requirements: Final cleaning.
- B. Upon completion of the work, all coating splatters or drippings shall be removed to the full satisfaction of the Owner.
  1. If the spray method is used for the application of the coating, care shall be taken to ensure that no overspray falls upon existing equipment and other materials/structures not to be coated.
  2. The Contractor shall be responsible for any and all damage resulting from overspray.
- C. Collect waste material which may constitute fire hazard, place in closed metal containers, and remove daily from site.
- D. Final clean up and restoring the site to its original condition is the responsibility of the Contractor.

1. All empty coating containers, waste coating, thinners and solvents will remain the property of the Contractor and will be properly disposed of and removed from the jobsite.
  2. Jobsite disposition of waste such as burning or pouring onto the soil or into surface drains will not be permitted.
- E. Before the work will be considered complete, all rubbish and unused material due to, or connected with, the progress of the work shall be removed from the premises and disposed of in a manner satisfactory to the Owner.
- F. All rubbish, debris, trash and unused material due to, or connected with work shall be removed from the premises and disposed of in a manner satisfactory to the Owner and the appropriate local, state or federal officials.

END OF SECTION