

# **GROVELAND COMMUNITY SERVICES DISTRICT**

## **BIG CREEK CLEARWELL REHABILITATION**

### **TECHNICAL SPECIFICATIONS**

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**PREPARED BY:**



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## **TABLE OF CONTENTS**

SECTION 011000 BID ITEM DESCRIPTIONS

SECTION 011100 COORDINATION OF WORK, PERMITS, AND REGULATIONS

SECTION 099000 CLEARWELL COATINGS

**SECTION 011000  
BID ITEM DESCRIPTIONS**

**PART 1 - GENERAL**

**1.01. BID ITEM # 1 – CLEARWELL REHABILITATION**

- A. This item is a lump sum item for the rehabilitation of the Big Creek Clearwell. The Clearwell consists of an above ground 2.0 MG welded steel tank with a diameter of approximately 125 ft and a side height of 24 ft. Rehabilitation work shall include removing existing epoxy coating, performing repairs or replacement of steel members that have corroded, and applying a new coating to all the interior surfaces (excluding baffles). Rehabilitation work will require the removal of existing polyethylene interior baffles prior to beginning the removal of the existing coating and the reinstallation of the baffles after the new coating has been applied. This lump sum bid item shall also include all work and operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for obtaining bonds, and insurance; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site. This item also includes demobilization, including removal of all equipment supplies, personnel, and incidentals from the project at the end of construction.

**1.02. ALTERNATE BID ITEM # 1 – EXTERIOR COATING OF CLEARWELL**

- A. This is a lump sum item for coating the exterior of the Clearwell. Exterior Coating shall include removing existing exterior epoxy coating, and applying a new coating to all the exterior surfaces.

**PART 2 - NOT USED**

**PART 3 - NOT USED**

END OF SECTION

**SECTION 011100  
COORDINATION OF WORK, PERMITS, AND REGULATIONS**

**PART 4 - GENERAL**

**4.01. DESCRIPTION**

- A. This section generally describes the project and includes work by others, work sequence and schedule, Contractor's use of premises, Owner occupancy, maintenance and operation of existing facilities, permits, and regulations.

**4.02. GENERAL NATURE OF WORK**

- A. The work involves the rehabilitation of the Clearwell at the Big Creek Pump Station including but not limited to the following:
  - 1. Recoating the interior of the Clearwell
  - 2. Recoating exterior of clearwell.

**4.03. LOCATION OF PROJECT SITE**

- A. The project site is located approximately 5 miles east of the community of Groveland along Highway 120.

**4.04. REFERENCE INFORMATION**

- A. GCSD conducted an interior survey of the Clearwell in April of 2016. A Report was generated as part of the interior survey. GCSD encourages all bidders to review the information in the survey report as well as pictures and videos recorded during the inspection.

**4.05. WORK BY OTHERS**

- A. The following construction activities will be performed by the Owner:
  - 1. Final disinfection of the Clearwell
- B. Contractor shall coordinate with Owner for the completion of the activities listed above.

**4.06. WORK SEQUENCE AND SCHEDULE**

- A. The Work shall proceed in the following order:
  - 1. Task 1 – Remove existing baffles
  - 2. Task 2 – Remove existing coating
  - 3. Task 3 – Repair Steel Members
  - 4. Task 4 – Apply new Coating

**4.07. CONTRACTOR'S USE OF PREMISES**

- A. Contractor use premises shall be for activities related to construction of improvements only.

**4.08. OWNER OCCUPANCY**

- A. The Owner will not operate the Big Creek Pump station while Contractor is completing this work. Contractor shall ensure a timely completion of the work.

**4.09. PERMITS**

- A. There are no permits being required for this work.

END OF SECTION

**SECTION 015100  
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

**PART 1 - GENERAL**

**1.01. CONSTRUCTION WATER**

- A. Water will not be available during the rehabilitation of the clearwell. The Contractor shall make his own arrangements for developing water sources and supply labor and equipment to collect, load, transport, and apply water as necessary.

**1.02. ELECTRICAL POWER**

- A. Power is available at the site. Contractor shall make his own arrangements to obtain power from the existing outlets and/or load panels.

**1.03. DUST CONTROL**

- A. Perform dust control operations to prevent construction operations from producing dust in amounts harmful to persons or causing a nuisance to persons living nearby or occupying buildings in the vicinity of the work. Use water or dust preventative to control dust.

**1.04. FIRE DANGER**

- A. Minimize fire danger in the vicinity of and adjacent to the construction site. Provide labor and equipment to protect the surrounding private property from fire damage resulting from construction operations.

**1.05. ACCESS ROADS AND PARKING AREAS**

- A. Obtain access to project site through the existing access road. Keep the existing gate accessible at all times so that the Owner's vehicles have access to the site.
- B. The Contractor and his employees will be permitted to park their vehicles at the site.

**1.06. EQUIPMENT AND MATERIAL STORAGE**

- A. Materials and equipment used in the Clearwell Rehabilitation may be stored at the Site or at GCSD's yard if sufficient space is available.
- B. GCSD is not responsible for vandalism or theft of Contractor's equipment and/or materials.

**PART 2 - MATERIALS**

**PART 3 - EXECUTION**

END OF SECTION

**SECTION 099000  
CLEARWELL COATINGS**

**PART 1 - GENERAL**

**1.01. DESCRIPTION**

- A. This section describes the materials, application and inspection of a the following coatings:
  - 1. A protective elastomeric polyurethane coating to be utilized on the interior surfaces.
  - 2. A protective epoxy coating to be utilized on the exterior surfaces.

**1.02. SUBMITTALS**

- A. Submit coating manufacturer's catalog data on formulation of materials and recommended use.
- B. Submit coating manufacturer's surface preparation recommendations including maximum height of surface profile on abrasive blast cleaned steel.
- C. Submit coating manufacturer's application instructions, equipment, temperature and humidity limitations, drying time, and recoat cycle time.
- D. Submit manufacturer's safety data sheets on coating products.
- E. Submit the name of the company and abrasive to be used, the generic type of abrasive, the State of California Air Resources Board (CARB) certification, and product data sheets.
- F. Submit product data and procedures for the dehumidification and temperature control system.
- G. Submit Contractor's proposed quality control plan to ensure that the protective lining is completed satisfactorily. Include tests, and equipment to be used to make that determination.

**1.03. REFERENCE DOCUMENTS**

- A. The following guidelines, documents, and references are to assist the Contractor in performing its duties for cleaning, surface preparation, and application of the coating systems. The documents listed form a part of this specification to the extent referenced.
  - 1. Quality Control: The following references provide the means of maintaining quality control of the blasting and coating systems:
    - a. Steel Structures Painting Council, National Association of Corrosion Engineers, and American Society for Testing and Materials Standards as follows:

<u>DESIGNATION</u>	<u>DESCRIPTION</u>
SSPC-SP1	Solvent Cleaning
SSPC-SP2	Hand Cleaning
SSPC-SP3	Power Tool Cleaning
SSPC-SP10	Near-White Metal Blast Cleaning
SSPC-PA 1	Shop, Field, and Maintenance Painting of Steel
SSPC-PA 2	Procedure for Determining Conformance to Dry Coating Thickness Requirements
NACE-Std.-RPO188-88	Discontinuity (Holiday) Testing of Protective Coatings
NACE-Std.-RPO 287-02	Field Measurement of Surface Profile of Abrasive Blast-Cleaned Steel Surfaces Using a Replica Tape
NACE-Std.-RPO288-88	Inspection of Linings on Steel and Concrete
ANSI/AWWA 652-02	Methods of Disinfection
ANSI/ASTM D4541	Test Method for Pull-Off Strength of Coatings Using Portable Adhesion-Testers

2. California and Local Regulations: The Contractor is solely responsible for accomplishing work in a safe manner, complying with, but not limited to, the following regulations:
  - a. CAL/OSHA, Title 8, Industrial Relations, Chapter 4, Division of Industrial Safety Orders, Subchapter 4, Construction Safety Order.
  - b. California Air Resources Board, Title 17, Subchapter 6, Abrasive Blasting.
  - c. Title 8, CCR, General Industrial Safety Orders (GISO), Section 5156, Scope & Definitions, and Section 5159, Confined Space Operations.
  - d. Title 8, CCR, Construction Safety Orders, Article 4, Sections 1528 to 1531, Dusts, Fumes, Mists, Vapor, and Gases.

#### **1.04. WORKER PROTECTION**

- A. Conform to federal, state, county, and GCSD safety and environmental protection codes and regulations. Do not create conditions for which GCSD is subject to citations by any regulatory agency. Should GCSD be cited for a condition under the control of the Contractor, the Contractor will be responsible for payment and settlement of said citation. Provide safety equipment, including that for confined space entry and safety equipment necessary for use by GCSD's Representative.
- B. Comply with applicable regulations for properly storing, handling, transporting, and disposing of any waste materials.
- C. Provide at least one working telephone on the jobsite at all times.
- D. During the interior abrasive blasting operations, blast operators shall wear National Institute of Occupational Safety and Health (NIOSH) approved air-supplied helmets. The air compressor used to supply breathing air shall conform to OSHA regulations on carbon monoxide and high-temperature protection and meet Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1 (ANSI S86.1). Breathing air shall also be free of dust, fumes, vapors, or gases that may result in harmful exposure. Other persons who are exposed to blasting dust shall wear approved filter-type respirators and safety goggles. When coatings are applied in confined areas, persons exposed to toxic vapors and dust shall wear NIOSH-approved air-supplied masks.
- E. Prepare a written respirator program per CAL/OSHA regulations. The elements of a respirator protection program are summarized, but not limited to, the following:
  1. Written standard operating procedures for selection and use;
  2. Employee instructions and training in the use and limitations of respirators;
  3. Regular cleaning and disinfection;
  4. Sanitary storage of respirators; and
  5. Regular inspection of respirators to assure that they are in good repair.
- F. Blasting and spraying hoses shall be grounded to prevent accumulation of charges of static electricity.
- G. Provide explosion-proof artificial lighting for all work-confined spaces. Light bulbs shall be guarded to prevent breakage. Lighting fixtures and flexible cords shall comply with the requirements of NEPA 70 NEC for the atmosphere in which they will be used.
- H. Coating materials may be irritating to the skin and eyes. When handling and mixing coatings, workers shall wear gloves and eye shields.

#### **1.05. PRECONSTRUCTION CONFERENCE**

- A. At least 14 days prior to the application of the coating system to the steel tank, schedule and arrange a conference with GCSD to coordinate the following:
  - 1. Surface preparation methods.
  - 2. Specification compliance of blast abrasives and surface profile.
  - 3. Schedule of blast cleaning and coating application.
  - 4. List of equipment for cleaning and coating applications.
  - 5. Weather limitations for acceptable work.

#### **1.06. QUALIFICATIONS**

- A. Contractor shall hold a valid State of California Contractor's Class C-33 license for performing abrasive blast cleaning and coating/painting work.
- B. Contractor shall have a minimum of five years' experience and successful history in the application of the specified products to surfaces of steel tanks.
- C. Contractor shall provide a supervisor at the worksite during cleaning and coating operations. The supervisor shall coordinate work, and make decisions. Provide skilled craftsmen qualified to perform the required work.

#### **1.07. INSPECTION AND QUALITY CONTROL**

- A. Contractor shall enlist the aid of various tests and implement those tests to verify the integrity of the applied lining to his satisfaction. GCSD shall be permitted full access at all times to observe and be satisfied that the specification is being followed.
- B. GCSD shall be given sufficient notice so as to be present, if desired, when the following hold points are reached:
  - 1. Completion of surface preparation.
  - 2. Prior to lining application.
  - 3. During wet and dry film thickness measurements.
  - 4. During pinhole detection testing.
  - 5. During lining repairs (if needed).
- C. At a minimum, the following quality control tests shall be performed by the Contractor with results recorded and made available to GCSD:
  - 1. Environmental conditions prior to lining application, including substrate temperature, ambient temperature, relative humidity and dew point.
  - 2. Observation of surface preparation, including anchor pattern, prior to lining application.
  - 3. Wet and dry film thickness measurements.
  - 4. Holiday testing
- D. The multi-component lining material shall be verified as to proper proportioning of materials at the start of each day and at any time of equipment malfunction before resuming operations. Any necessary site clean-up due to installing improperly reacted materials shall also be made at that time.
- E. The following inspection equipment (or approved equal) shall be utilized by the contractor for performing quality control testing:
  - 1. Sling psychrometer
  - 2. Surface temperature thermometer



3. Ambient temperature thermometer
  4. Psychrometric charts for determining relative humidity and dew point
  5. High range wet and dry film thickness gages
  6. Micrometer
  7. Durometer; A and D Scale
  8. Sample cans
  9. Inspection glass (30 power minimum)
  10. High voltage pinhole detector
- F. The lining shall be 100% visually inspected for holes, voids, and thin areas.
  - G. Contractor shall conduct high-voltage discontinuity testing to assure a "pinhole-free" lining system shall be in accordance with NACE Standard RPO188-88, "Discontinuity (Holiday) Testing of Protective Coatings."
  - H. The contractor shall verify that the applied coating material has reached cure, as evidenced by hardness, prior to placing into service.
  - I. Water tanks will be disinfected in accordance with the ANSI/AWWA Standard for Disinfection of Water-Storage Facilities, ANSI/AWWA C652-02.

#### **1.08. EXISTING COATING SYSTEMS**

- A. It is the Contractor's responsibility to estimate the quantity and classification of the wastes resulting from the removing the existing coating system, and to accumulate, transport, and dispose of all wastes at no additional cost to GCSD.
- B. The tank was last coated during construction in 1995 with a 100% solids urethane or epoxy; it is the Contractors responsibility to determine the type of coating that is presently in place.

### **PART 2 - MATERIALS**

#### **2.01. INTERIOR COATING**

- A. All materials of the specified interior coating system shall be provided by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the coating manufacturer for the specified system.
- B. Coating materials, including additives to be used on interior tank surfaces, shall not contain trichloroethylene (TCE) or tetrachloroethylene (PCE) volatile organic constituents.
- C. No request for product substitution will be considered which decreases the dry-film thickness designated, the number of coats to be applied, or which changes the generic type of coating specified.
- D. The applied material shall be a two-component (2:1 mix by volume) chemically reactive product specially formulated 100 percent solids, aromatic, MDI, elastomeric polyurethane coating/lining system, and shall be applied using a heated "plural component" proportioning equipment system designed for high pressure airless spray application.
- E. Coating material shall be National Sanitary Foundation (NSF) 61 approved.
- F. The total dry film thickness of the lining shall be 100 mils.
- G. Interior coating shall be ENDURA-FLEX® 1988, DURASHIELD™ 310, Raven Aquataflex 510 or equal.

## **2.02. EXTERIOR COATING**

- A. Coating shall consist of a high-build epoxy intermediate coat having a minimum volume solids of 60%, with an inorganic zinc prime coat and a pigmented polyurethane finish coat having a minimum volume solids of 52%.
- B. Prime Coat shall consist of a self-curing, two-component inorganic zinc-rich coating recommended by the manufacturer for overcoating with a high-build epoxy finish coat. Minimum zinc content shall be 12 pounds per gallon. Apply to a thickness of 3 mils. Products: Sherwin-Williams Zinc-Clad II Plus, or equal.
- C. Intermediate Coat shall consist of high-build epoxy such as Sherwin-Williams Macropoxy 646 B58-600 or equal. Apply to a thickness of 6 mils.
- D. Finish Coat shall consist of a two-component pigmented acrylic or aliphatic polyurethane recommended by the manufacturer for overcoating a high-build epoxy coating. Apply to a thickness of at least 2 mils. Products: Sherwin-Williams Hi-Solids Polyurethane 250, or equal.

## **PART 3 - EXECUTION**

### **3.01. REMOVAL AND REINSTALLATION OF BAFFLES**

- A. Contractor shall remove the three baffles present in tank prior to providing any surface preparation, coating, or other recoating related work. Baffles shall be stored in a secure location.
- B. Contractor shall reinstall baffles to the original locations after the completion of all recoating related work.
- C. Any damage to the tank or baffles during removal, storage, and reinstallation of baffles shall be the Contractor's responsibility. Contractor shall repair tank and/or baffles to the original condition at no expense to the Owner.

### **3.02. STEEL MEMBER REPAIRS**

- A.

### **3.03. DELIVERY AND STORAGE OF COATING MATERIALS**

- A. Deliver coating materials to the job in original sealed containers identified with labels indicating manufacturer; product name and number; color, batch, or lot number; and date of manufacture. Note the date of manufacture and apply coatings prior to the expiration of the guaranteed storage life. Coating materials exceeding storage life will be rejected.
- B. Store coating materials in enclosed structures to protect from weather and excessive heat or cold. Conform to state and local requirements for flammable materials.

### **3.04. PROTECTION OF THE WORK**

- A. Protect adjacent work and surfaces not to be coated from blast cleaning, overspray, spattering, and spillage. Use protective coverings or drop cloths. Where protection is required or provided for coated surface, maintain until the coating has properly cured. Do not handle, work on, or disturb these areas until the coating is completely dry and hard.

### **3.05. EQUIPMENT**

- A. Contractor shall utilize Plural Component proportioning equipment capable of pumping two separate streams of polyurethane components at the required ratio volumetrically.
- B. Contractor shall have capability to heat the two different liquid components to a process temperature range from 100° to 125° Fahrenheit (38° to 52° C). The use of band heaters is not acceptable.
- C. Contractor shall have capability to maintain process temperature to spray through a gun or pour through the nozzle. The use of insulated heat-trace fluid lines is mandatory.

- D. Contractor shall have capability to pump at pressures ranging from 1,200 PSI to 3,000 PSI.
- E. Contractor shall have capability to bring the two separately proportioned streams together as one stream and mix them together to provide a homogeneous mixture for reacting into a solid polymer of known properties.
- F. Contractor shall provide spray atomization tip sizes matched to the pumping equipment output which provides a fully atomized spray pattern, free of "fingers" without the addition of solvents of any kind.
- G. Use compressors with traps and filters to remove water and oils from the air.

### **3.06. VENTILATION OF TANK INTERIOR**

- A. Use forced-air ventilation at all times and after the application of the interior coating systems. It is essential that any vapors released during the application and from the deposited film be removed from the tank interior. During the coating application, provide a ventilating system with a capacity of at least 300 cfm per gallon of coating applied per hour. After the application of the finish coat, force-ventilate the tank continuously at a rate of one air change per hour for a period of three days. If Contractor has any doubt about the adequacy of the curing conditions, provide additional curing time with continued forced-air ventilation.

### **3.07. HUMIDITY AND TEMPERATURE CONTROL**

- A. Use dehumidification equipment to control the environment within the tank 24 hours per day during blast cleaning, coating, and coating curing. Dehumidification equipment shall:
  - 1. Supply sufficient dry air so that the air adjacent to the work surfaces shall not exceed 75% relative humidity at any time during the blasting, coating, or curing cycle.
  - 2. Maintain a minimum temperature inside the tank of at least 10°F above the dew point
- B. Air heaters or refrigeration equipment are not acceptable substitutes for dehumidification.
- C. Seal the space to be controlled as well as possible, allowing air to escape at the bottom of the space away from the point where the dehumidified air is introduced. Maintain a slight positive pressure within the space, unless dust from the blasting operation is hazardous.
- D. If it is necessary to filter the air escaping the tank, design the filtration system to match the air volume of the dehumidification equipment to avoid interference with the ability to control the space as described herein. Do not recirculate air from the space or from filtration equipment back through the dehumidifier when coating or solvent vapors are present.

### **3.08. SURFACE PREPARATION PRIOR TO ABRASIVE BLAST CLEANING**

- A. Remove accumulated sand and silt from the bottom of the tank.
- B. Remove oil, grease, dust, dirt, rust, moisture, mill scale, and all other foreign or interference substances that would adversely affect the adhesion or durability of the coating system.
- C. Remove weld spatter and weld slag, and grind smooth rough welds, beads, peaked corners, and sharp edges, including erection lugs, in accordance with SSPC SP-2 and SSPC SP-3.

### **3.09. ABRASIVE BLAST CLEANING**

- A. Steel surfaces shall be abrasive blasted to the SSPC-SP-10 Near-White Metal condition.
- B. Do not blast clean when conditions would not permit the subsequent application of coating. Blast-clean only the area that can be coated during the same day. In the event that a cleaned surface colors, oxidizes, or becomes moist, blast-clean it again before applying the coating.
- C. Use an abrasive media of 30-mesh graded hard non-silica base as recommended by the manufacturer of the specified coating system. Measurement of surface profile will be in

accordance with NACE RP0287-02. Abrasive media used for cleaning shall be washed, uniformly graded, dry, and free of contaminants. Do not recycle or reuse blast particles.

- D. After blast cleaning and prior to application of coating, dry clean surfaces to be coated by dusting, sweeping, or vacuuming to remove residue from blasting and ensure that there are no surface contaminants. Apply the specified coating within the period of an eight-hour working day. Do not apply coating over damp or moist surfaces. Re-clean prior to application of primer or touch-up coating any blast-cleaned surface not coated within said eight-hour period.
- E. Keep the area of the work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard. Cover the tank inlet, outlet, drain, and overflow piping, and prevent blasting particles from being blown into the piping.
- F. During blast cleaning, exercise caution to prevent damage to adjacent preapplied coatings. Schedule blast cleaning and coating such that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces. Restore any damaged coatings to their specified condition.

### **3.10. LIMITATIONS ON THE APPLICATION OF COATINGS**

- A. Follow manufacturer's recommendations and limitations
- B. Do not apply coatings under the following conditions:
  - 1. When the temperature of the surface to be coated is more than 5°F below the air temperature or when the surface temperature is over 120°F.
  - 2. When the surface to be coated is wet, moist, or contaminated with any foreign matter.
  - 3. During rain, snow, fog, or mist or when the relative humidity exceeds 85%.
  - 4. When the surface temperature is less than 5°F above the dew point within eight hours after application of coating.
- C. If above conditions are prevalent, the application of coating shall be delayed or postponed until conditions are favorable. Dew or moisture condensation should be anticipated, and if such conditions are prevalent, coating work shall be delayed until midmorning to be certain that the surfaces are dry. The day's coating shall be completed in time to permit the film sufficient drying time prior to damage by climatic conditions.
- D. If a change in climatic conditions damages a coating application, repair the damaged coatings to its specified condition. The Contractor is responsible for damaged coatings.

### **3.11. PROCEDURES FOR THE APPLICATION OF COATINGS**

- A. Before start of application and at such times when long breaks are involved or application equipment malfunctions, the following four material quality tests are recommended:
  - 1. A ratio check to verify required volumetric proportioning.
  - 2. A mixed material check to verify proper mixing of components.
  - 3. Curing cycle test to verify the proper reaction is under way. At least a pint sample is to be utilized. First Durometer results should be determined in 15 minutes.
  - 4. A weight check (10 oz. container with solid material and a 10 oz. container with expanded material) to verify proper expansion rate.
- B. Successive topcoats shall be applied within 24 hours so as to not exceed the recoat window.
- C. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

- D. Stir, strain, and keep coating materials at a uniform consistency during application. Apply each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Finished surfaces shall be free from holidays, defects, or blemishes.
- E. Prior to coating application, brush coat with the coating material all welds, sharp edges, nuts, bolts, and irregular surfaces difficult to coat to provide complete coverage of all surfaces.
- F. Do not use thinners.
- G. Remove dust, blast particles, and other debris from blast-cleaned surfaces by dusting, sweeping, and vacuuming. Allow ventilator fans to clean airborne dust to provide good visibility of working area prior to coating applications. Remove dust from coated surfaces by dusting, sweeping, and vacuuming prior to applying succeeding coats.
- H. Apply coating system to the specified minimum dry-film thicknesses as measured from above the peaks of the surface profile. Measurement shall be in accordance with SSPC PA-2 and shall be corrected for the magnetic effect of the surface profile.

### **3.12. APPLICATION OF COATING SYSTEMS**

- A. The coating systems shall be installed as a liquid seamless system by spray, allowing the material to conform to the profile of the substrate, creating a non-stressed, non-seamed monolithic film.
- B. Wet film thickness shall be monitored throughout the installation by means of frequent measurements with a high range wet film thickness gage.
- C. All layers of material shall be applied the same day, if possible. This procedure is to ensure minimization of contamination of the lining. If the project is not completed, then at the end of the work day a 3 to 12 inch "returning edge" of material will be left tapered to the substrate for the start of the next work day. The "returning edge" shall be cleaned with MEK, Xylene, or Naptha (as allowed) before proceeding to spray on start-up the following work day.
- D. The spray application shall be in accordance with the principles of good workmanship outlined in SSPC-PA-1, and shall provide a finish which is continuous, uniform in thickness and free of pores or other defects.

### **3.13. INSPECTION FACILITIES**

- A. Provide GCSD's Representative with facilities for inspection including:
  - 1. Illumination and labor to move the lights, whenever required by GCSD's Representative. Provide additional lights and supports sufficient to illuminate areas to be inspected. GCSD's Representative will determine the level of illumination required for inspection purposes.
  - 2. Temporary ladders and scaffolding. Erect and move to the locations requested by GCSD's Representative.

### **3.14. INSPECTION AND TESTING**

- A. Contractor will perform such tests as are required to demonstrate substantial compliance with all phases of the surface preparation, abrasive blast cleaning, and application of the coating systems. Test Equipment will be calibrated in the presence of a GCSD's Representative to verify its accuracy prior to use.
- B. Notify GCSD's Representative three working days in advance of field operations involving abrasive blast cleaning and coating applications.
- C. Contractor will verify the degree of surface cleanliness profile of the field blast cleaned surface. Perform additional blast cleaning over areas not conforming to the specified surface preparation.

- D. Contractor will inspect coating to determine thickness and integrity in the presence of GCSD's Representative. Coating will be checked and deficiencies marked. After observing specified recoat time, apply additional coating materials over areas not having the specified minimum dry-film thickness and areas having any holidays or pinholes. After correction of deficiencies, Contractor will re-inspect those areas in the presence of GCSD's Representative to determine the acceptability of the additional coating. Each coating application must be 100% to the satisfaction of GCSD's Representative prior to succeeding coating applications.
- E. Contractor will provide all test equipment as specified.

### **3.15. REPAIRS**

- A. Any damaged areas, faulty areas, or discontinuities (pinholes) found during quality control inspection within a 24 hour (within the recoat window) period of application shall be corrected as follows:
  - 1. Damaged or Faulty Areas (i.e., impact damage, off-ratio application, etc.): Clean the area thoroughly with suitable solvent (as allowed) to decontaminate and remove all oils and grease from the surface, (do not apply excessive solvent to pinhole area, the intent is to clean only), allow solvent to thoroughly dry. When thoroughly dry to touch, re-apply with specified material to the specified thickness, feathering the material into the existing lining.
  - 2. Discontinuity (pinhole) Repair: Clean the immediate area as in Section "A" above. Hand apply (putty Knife, etc.) a small amount of mixed material directly to the pinhole. For pinhole repairs, hand mix and thoroughly blend a small amount (normally two or three ounces at a time, for each applicator) of Part A and Part B in correct ratios and after mixing, use immediately.
- B. Any damaged areas, faulty areas, or discontinuities (pinholes) found during quality control inspection after 24 hours of lining installation (exceeding recoat window) shall be corrected as follows:
  - 1. For pinhole repairs or low film thickness; Clean the area thoroughly as necessary and practical with solvent or HPWW (High Pressure Water Wash) depending on size of area prior to abrading the surface to decontaminate and remove all oils and grease from the surface, (do not apply excessive solvent to pinhole area, the intent is to clean only), allow solvent to thoroughly dry. Abrade the surface using abrasive blast or hand/power tools, as practical, to remove surface shine, and to roughen the surface. After abrading the surface, vacuum or blow down with clean, dry compressed air thoroughly to remove all loose particles and dust. Re-apply with specified material, take care to protect any un-abraded surface to avoid delimitation of the repair material.
  - 2. For damaged areas; Clean the area thoroughly as necessary and practical with solvent or HPWW depending on size of area prior to abrading the surface, extending at least six inches (15 cm.) beyond the damaged area to decontaminate and remove all oils and grease from the surface, allow solvent to thoroughly dry. Abrade the surface using abrasive blast or power tools, as practical, down to and including exposed bare substrate to remove surface shine and roughen the surface, prepare the substrate to the original standard. Feather the coating edges surrounding the damaged area. After abrading the surface, vacuum or blow down with clean, dry compressed air thoroughly to remove all loose particles and dust. Re-apply with specified material, take care to protect any un-abraded surface to avoid delamination of the repair material.

### **3.16. DISINFECTION (BY GCSD)**

- A. Disinfect the interior surfaces of the tank after the coating system has dried and cured. Observe the manufacturer's recommendations of the specified coating system for ventilation requirements and time interval for complete drying.

- B. Prior to disinfection, Contractor shall remove all scaffolding, planks, tools, rags, and other material not a permanent part of the tank. Thoroughly flush the inlet and outlet piping with potable water. Use a high-pressure water blaster and wash interior surfaces of the tank with potable water. Drain and squeegee water, dirt, and foreign material accumulated in this cleaning operation from the tank.
- C. Disinfect the tank by chlorination in accordance with the requirements of AWWA C652. Use either liquid chlorine or sodium hypochlorite solution as the available form of chlorine. Do not use calcium hypochlorite in granular or tablet form. Spray a chlorine solution having a chlorine content of 300 mg/L on the interior surfaces to be in contact with water when the tank is put into service. Do not drain the used chlorine solution from the tank during the spraying operation.
- D. At the completion of disinfection, partially fill the tank with water to a depth of 1 foot and retain for four hours minimum. After the four-hour period, drain and squeegee chlorinated water from the tank. Rinse with potable water.
- E. Discharge of chlorinated water into watercourses or surface waters is regulated by the NPDES. Prior to discharge, review with GCSD and county health department the location and rate of flow of discharge. Apply a reducing agent to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. See AWWA C652, Appendix B for neutralizing chemicals.
- F. Potable water necessary for the wash down, disinfection, and rinse will be provided by the Owner. The Contractor shall make all connections to the Owner-installed meter and reduced-pressure backflow prevention device. The Owner will fill the tank with potable water to the overflow level after the Contractor has completed the disinfection operation.
- G. After the clearwell has been filled to the overflow level, the Owner's Representative will take two water samples from the tank for bacteriological testing within six hours and obtain a bacteriological quality test to demonstrate the absence of coliform organisms. If the testing procedure shows the presence of coliform bacteria, provide additional chlorination of the water in the tank and retest. Continue disinfecting and retesting until satisfactory results are achieved.
- H. Owner will submit results to Department of Health Services prior to placing tank in service.

**3.17. TESTING FOR VOLATILE ORGANIC CONSTITUENTS (BY GCSD)**

- A. After the clearwell has been disinfected and filled to the overflow level, allow a five-day soaking period for the interior coating systems to leach organic compounds into the water.
- B. At the completion of the soaking period, GCSD's Inspector will take water samples from the tank and deliver the samples to the state-approved laboratory for analysis.
- C. GCSD will engage the services of a testing laboratory approved by the State of California Department of Public Health to perform a total organic scan and analysis report.
- D. If levels of the volatile organic compounds exceed the action levels recommended by the Department of Public Health, drain the tank, cure and force ventilate the tank for a minimum of 10 days, disinfect, refill, allow to soak, and retest at the Contractor's expense. This process shall continue until the sample passes. The Owner will deduct the cost of water used to refill the tank from progress payments due the Contractor.

**3.18. ONE-YEAR INSPECTION OF COATING SYSTEM**

- A. The Contractor shall warrant the work to be performed as specified and free of defects attributed to Contractor's control and workmanship for a period of one year. During such time necessary repairs will be for the Contractor's account.
- B. GCSD will conduct a warranty inspection of the interior surfaces of the tank one-year following final acceptance of the work. GCSD will establish the inspection date and notify the Contractor.

- C. GCSD will provide underwater inspection by means of videotape with photos. If the underwater examination reveals failed areas of coating, then GCSD will drain and wash down the tank. Where coatings have peeled off, bubbled, or cracked, and any location where rusting is evident shall be considered to be a failure of the coating system. Perform repairs at failures by removing the deteriorated coating. Prepare the surface by abrasive blast cleaning and apply the same coating systems as specified in this section. Inspection and repairs shall be performed at no cost to GCSD.

END OF SECTION