



Job Order Cost Proposal



CONTRACTOR NAME: **Felix Construction Company**

Contract Type:	Water Wastewater JOC - PW19-JOC02
Job Order No.:	TBD
City Project Mgr.:	Scott Ketchmark
Fee Type:	GMP
Location:	Cottonwood Well Site
Job Title:	Cottonwood Tank Rehab

City Project No.:	TBD
Contractors Job No.:	1902.XXX
Prepared By:	Kory Burden
Date:	8/29/2023
Revision:	Rev 01

Description of Work to be Performed (supporting information attached): See attached Bid Scope and Bid Assumptions for additional information and clarifications.

SECTION 1: LABOR (inclusive of burden)

Position	Unit	Quantity	Labor Cost	
			Unit Price	Total
Estimator	Hours	-	\$ 75.00	\$ -
Project Manager	Hours	225.00	\$ 80.00	\$ 18,000.00
Project Engineer	Hours	472.73	\$ 55.00	\$ 26,000.00
Admin	Hours	-	\$ 35.00	\$ -
Project Superintendent	Hours	53.33	\$ 75.00	\$ 4,000.00
Foreman	Hours	19.20	\$ 65.00	\$ 1,248.00
Craftsman	Hours	22.22	\$ 45.00	\$ 1,000.00
Apprentice / Laborer	Hours	44.91	\$ 28.50	\$ 1,280.00
Elect Professional Engineer	Hours	-	\$ 85.00	\$ -
Elect Project Manager	Hours	-	\$ 80.00	\$ -
Elect Technician - Lead	Hours	-	\$ 55.00	\$ -
Elect Technician - Journeyman	Hours	-	\$ 45.00	\$ -
Elect Technician - Apprentice	Hours	-	\$ 36.00	\$ -
Elect General Laborer	Hours	-	\$ 28.50	\$ -
Elect Admin	Hours	-	\$ 35.00	\$ -
<i>*Any emergency or T&M work that requires overtime will be billed at 1.5 times the listed Unit Prices.</i>				\$ 51,528.00

SECTION 2: EQUIPMENT (supporting information attached)

Item	Unit	Quantity	Equipment Cost	
			Unit Price	Total
Backhoe	Hours	-	\$ 51.36	\$ -
Excavator	Hours	-	\$ 142.94	\$ -
Loader	Hours	-	\$ 65.60	\$ -
Boom Truck	Hours	-	\$ 54.44	\$ -
Water Truck	Hours	-	\$ 61.93	\$ -
Water Wagon	Hours	-	\$ 14.98	\$ -
Air Compressor	Hours	-	\$ 16.48	\$ -
Compactor - Hand	Hours	-	\$ 9.00	\$ -
Dump Truck	Hours	-	\$ 63.36	\$ -
Roller	Hours	-	\$ 37.75	\$ -
ext. Reach Forklift	Hours	-	\$ 52.82	\$ -
Crane	Hours	-	\$ 129.94	\$ -
Pickup Truck - Light Duty	Hours	678.17	\$ 16.81	\$ 11,400.00
Pickup Truck - 1 Ton	Hours	66.00	\$ 25.43	\$ 1,678.38
Small Tools & Supplies (Consumables)	Hours	64.00	\$ 7.00	\$ 448.00
Manlift	Hours	24.27	\$ 39.55	\$ 960.00
Portable Welder	Hours	-	\$ 14.75	\$ -
Other Equipment	Hours	-	\$ 1.00	\$ -
Subtotal Equipment Cost (B)				\$ 14,486.38

SECTION 3: MATERIALS

Item	Unit	Quantity	Material Cost	
			Unit Price	Total
N/A		-	\$ -	\$ -
Subtotal Material Cost (C)				\$ -

SECTION 4: SUBS & CONSULTANTS

Company	Description of Work to be Performed (Supporting quote & information attached)	Total Cost
Revolution Industrial	Tank Rehab	\$ 182,300.95
Subtotal Subcontractors & Consultants (D)		\$ 182,300.95

SECTION 5: RENTAL EQUIPMENT

Company	Description of Rental Equipment (Supporting quote & information attached)	Total Cost
N/A		\$ -
Subtotal Rental Equipment (E)		\$ -

SECTION 6: GENERAL CONDITIONS OF THE WORK

Item	Unit	Quantity	General Conditions Cost	
			Unit Price	Total
Mobilization / Demobilization	LS	1.00	\$ -	\$ -
Permits & Environmental Controls	LS	1.00	\$ -	\$ -
Temporary Facilities & Controls	LS	1.00	\$ 3,720.00	\$ 3,720.00
Engineering / Testing (3rd Party NACE)	LS	1.00	\$ 10,230.00	\$ 10,230.00
Site Support	LS	1.00	\$ -	\$ -
Miscellaneous / Other	LS	1.00	\$ -	\$ -
Subtotal General Conditions (F)				\$ 13,950.00

OVERHEAD: **6.00%** (% to be taken from matrix)PROFIT: **10.00%** (% to be taken from matrix)

Subtotal General Contractor Costs (1+2+3+5+6): \$ 79,964.38
O&P (**16.00%** of 1+2+3+5+6): \$ 12,794.30
Total General Contractor Costs including O&P: \$ 92,758.68

Subtotal Subcontractor Costs (4) \$ 182,300.95
Subcontractor Profit (**5%** of 4) \$ 9,115.05
Total Subcontractor Costs including Profit: \$ 191,416.00

TOTAL GC Cost (Including O&P) and Subcontractor: \$ 275,059.63
Costs (including Subcontractor Profit): \$ 284,174.68
Insurance Costs @ **1.0%** \$ 2,750.60
Bond Costs @ **1.5%** \$ 4,125.89
Sales Tax (65% of **9.3%**) \$ 17,043.04
Tax Exemption Credit: \$ -

Subtotal Job Cost: \$ 308,094.21

Project Contingencies \$ 90,000.00

Project Allowances \$ -

*Owner must provide prior approval (in writing) before the use of any Allowance or Contingency Funds***TOTAL JOB COST: \$ 398,094.21**

Submitted by:

Project Manager

Tuesday, August 29, 2023

Date

Job Order Cost Proposal Clarifications

Project: **Cottonwood Tank Rehab**

Date: **8/29/2023**

Revision: **Rev 01**

Includes:

- 1 Updated technical specifications (see attached)
- 2 Removal of all oil/debris from tank
- 3 New manway gaskets
- 4 11 month anniversary inspection
- 5 3rd Party NACE inspections during the work
- 6 Exterior pipe coatings per El Mirage color chart
- 7 Removal of 2" port on lower ring of tank

Excludes:

- 1 All bid alternates list in technical specifications
- 2 Permits
- 3 Hazardous Materials Testing and Abatement

Clarifications:

- 1 Due to current market volatility, material pricing is subject to the terms stated on the included material quotes, some of which may establish that final pricing will be determined at the time of shipment.
- 2 We plan on removing and reinstalling the existing cathodic systems
- 3 Reservoir size is 50 foot diameter x 36 foot tall

Price Assumes:

- 1 Normal Working Hours
- 2 Existing cathodic protection system is in good / operating condition

Assumes Owner to Provide:

- 1 Access to the site

Potential Contingency Usage:

- 1 Material price escalations due to current market volatility.
- 2 Alternates listed in technical specifications attached.
- 3 Additional modifications/corrections not listed on the attached technical specifications.
- 4 Temporary piping system(s) of any kind
- 5 BAC-T testing services/analysis

Project Allowance Details:

- 1

**City of El Mirage
JOC Pricing Matrix**

PW19 - JOC02, Job Order Contract for Water & Wastewater Projects
Contractor: Felix Construction Company



Indirect Cost of the Work	\$1,000 to \$5,000	\$5,001 to \$10,000	\$10,001 to \$30,000	Over \$30,000
Gc Overhead	6.00%	6.00%	6.00%	6.00%
Gc Profit	20.00%	17.00%	15.00%	10.00%
Subcontractor	5.00%	5.00%	5.00%	5.00%
Bonds	1.50%	1.50%	1.50%	1.50%
Insurance	1.00%	1.00%	1.00%	1.00%
AZ/County/City/Tax	6.045%	6.045%	6.045%	6.045%
Total Indirect Cost %	34.54500%	31.54500%	29.54500%	24.54500%

TECHNICAL SPECIFICATIONS

WATER STORAGE TANK INSPECTION AND REPAIR For .50 MG COTTONWOOD STEEL WATER TANK

PART 1 – GENERAL

1.01 PURPOSE

- A. The purpose of this specification is to establish a scope for work to include, but not be limited to, inspection, rehabilitation, repair, repainting, final inspection, washout and disinfection of our steel water storage tank in the City's potable water system.

1.02 SCOPE OF WORK

- A. **(Base Price)** Work to be accomplished will be specific to the maintenance, inspection, repair, and painting of existing water storage tanks under the Coating System Evaluation for the Cottonwood Steel Water Storage Tank.
1. Exterior
 - a. Replace existing vent with a 24" vent
 - b. Install fall arrest systems and a set of supports at 22' on exterior ladder
 - c. Install (8') safety railings/boot plate to both sides of the roof safety ladder cage
 - d. Pressure wash exterior roof for chalking, dirt prior to new coating
 - e. Scratches, nicks and abrasion repair of roof
 - f. Tie coat followed by a TNEMEC Epoxy finish coatings applied
 2. Interior
 - a. Lower the overflow box height to 6" below roof rafters ?
 - b. Remove all corrosion between roof plate interfaces (roof wedging)
 - c. Remove all interior coating by abrasive blasting
 - d. Restore floor integrity to original design
 - e. Recoat interior surfaces with TNEMEC Epoxy Coatings
 - f. Clean and properly remove all oil / debris from tank
 3. Disinfection
 - a. AWWA Standard C652 recommended procedure
 4. Warranty Inspection
 - a. 12 Month inspection by an NACE Level 3 certified tank inspector
- B. *(Alternates) Additional improvements not included in the base scope.*
1. *New Ladder W/Safety Door and Saf-T Climb System*
 2. *Roof Tie-off points*
 3. *Exterior pipe coating per El Mirage Color Chart*

- ~~4. Level Board (Varec 2100 W/ Stainless Steel Wetted Parts)~~
5. Removal of 2" Port on lower ring of tank
6. Re-bottom Steel Floor
7. New Cathodic Protection System
8. Floor & Shell Repairs (6" round plates welded) EA

2.0 SAFETY AND HEALTH REQUIREMENTS

A. H. **Warranty Inspection:** Warranty inspection shall be conducted eleven months following completion of all coating and painting work. The inspection is to include structural conditions, sanitary conditions, and regulatory items. The condition of the tank is to be reported to the City of El Mirage in writing within thirty (30) days after completing the inspection. **This report must be prepared by an inspector having a NACE Level III, or higher, certification.** Color photographs should be attached to document the findings. Corrections to observed problems are to be made within a reasonable time.

All defective work shall be repaired in strict accordance with this specification and to the satisfaction of the Water Division Supervisor.

1. Notification: The Owner shall establish the date for the Inspection and shall notify the Contractor at least 30 days in advance.
2. Inspection: The entire interior coating system shall be visually inspected. All defective coating as well as damaged or rusting spots shall be satisfactorily repaired by and at the sole expense of the Contractor. All repaired areas shall then be electrically tested as specified in the above mentioned section and repair/electrical testing procedures repeated until surface is acceptable to the Water Division Supervisor. The entire exterior paint system shall be inspected as specified. All defective, damaged or rusting areas shall be repaired by and at the sole expense of the Contractor.
3. Inspection Report: The Owner shall prepare and deliver to the Contractor an inspection report covering the first anniversary inspection, setting forth the number and type of failures observed; the percentage of the surface area where failure has occurred, and the names of the persons making the inspections.
4. Schedule: Upon completion of inspection and receipt of Inspection Report as noted herein, Owner shall establish a date for Contractor to proceed with remedial work. Any delay on part of Contractor to meet schedule established by Owner shall constitute breach of this contract and Owner may proceed to have defects remedied as outlined under General Provisions.
5. Remedial Work: Any location where coating or paint has peeled, bubbled, or cracked and any location where rusting is evident shall be considered to be a

failure of the system. The Contractor shall make repairs at all points where failures are observed by removing the deteriorated coating or paint, cleaning the surface, and recoating or repainting with the system. If the area of failure exceeds 20% of a specific coated or painted surface, the entire coating or paint system may be required to be removed and recoated or repainted in accordance with the original specification.

a. Specific coated or painted surfaces are defined as follows:

- (1) Underside of roof and support structure.
- (2) Shell - interior
- (3) Bottom - interior
- (4) Attachments, accessories, and appurtenances - interior
- (5) Roof - exterior
- (6) Shell - exterior
- (7) Attachments, accessories, and appurtenances - exterior

6. Costs: All noted costs for Contractors inspection and all costs for repair shall be borne by the Contractor and in figuring his bid, the Contractor shall include an appropriate amount for testing and repair as no additional allowance will be paid by the Owner for said inspection and repair.

2.01 SAFETY AND HEALTH REQUIREMENTS

A. General: Ventilation, electrical grounding, and care in handling coatings, paints, solvents and equipment are important safety precautions during coating and painting projects.

Contractor shall conform with safety requirements set forth by regulatory agencies applicable to the construction industry and manufacturers printed instructions and appropriate technical bulletins and manuals. The Contractor shall provide and require use of personal protective life saving equipment for persons working in or about the project site.

B. Access Facilities: All ladders, scaffolding and rigging shall be designed for their intended uses. Ladders and scaffolding shall be erected where requested by Water Division Supervisor to facilitate inspection and be moved by the Contractor to locations requested by the Water Division Supervisor.

C. Ventilation: Where ventilation is used to control hazardous exposure, all equipment shall be explosion-proof or industrial design and shall be approved by the Water Division Supervisor. Household-type venting equipment will not be acceptable. Ventilation shall reduce the concentration of air contaminants to the degree a hazard does not exist by ducting air, vapors, etc. from the confined space. Air circulation and exhausting of solvent vapors shall be continued until coatings have fully cured.

Forced air induction during blast cleaning and coating application operations is mandatory. If dehumidification equipment is used, equipment must be operated on a continuing basis during all blasting, coating and curing operations, including shifts during which no work is being accomplished.

1. Ventilation system shall be furnished and installed by the Contractor in accordance with these specifications. The Contractor shall make modifications to the ventilation system as directed by the Water Division Supervisor to ensure a safe working environment and complete removal of all solvent vapors. Upon completion of the final curing period, as determined by the Water Division Supervisor, the Contractor shall remove the ventilation system.
 - a. The exhaust blower capacity shall be sufficient to maintain air changes within reservoir interior in accordance with OSHA regulations and coating manufacturer's recommendations.
 2. If Contractor proposes to use dehumidification equipment, or any other alternate ventilation system, Contractor must submit, in advance, for approval by the Water Division Supervisor, a complete list of the equipment and procedures for its use.
- D. Head and Face Protection and Respiratory Devices: Equipment shall include protective helmets which shall be worn by all persons while in the vicinity of the work. During abrasive blasting operations, nozzle men shall wear U.S. Bureau of Mines approved air-supplied helmets and all other persons who are exposed to blasting dust shall wear approved filter-type respiratory and safety goggles. When coatings are applied in confined areas all persons exposed to toxic vapors shall wear approved air-supplied masks. Barrier creams shall be used on any exposed areas of skin.
- E. Grounding: Blasting, spray and air hoses shall be grounded to prevent accumulation of charges of static electricity.
- F. Illumination: Spark proof artificial lighting shall be provided for all work in confined spaces. Light bulbs shall be guarded to prevent breakage. Lighting fixtures and flexible cords shall comply with the requirements of NFPA 70 National Electric Code for the atmosphere in which they will be used. Whenever required by the Water Division Supervisor, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the Water Division Supervisor.
- G. Toxicity and Explosiveness: The solvents used with specified protective coatings are explosive at low concentrations and are highly toxic. Because of toxicity, the maximum allowable concentration of vapor shall be kept below the maximum safe concentration for eight-hour exposure, plus Lower Explosive Limit must be strictly

adhered to. All regulations related to safety personnel and handling of such materials shall be strictly adhered to.

- H. Protective Clothing: Coating and paint materials may be irritating to the skin and eyes. When handling and mixing coatings and paints, workmen shall wear gloves and eye shields.
- I. Fire: During mixing and application of coatings and paints, all flames, welding and smoking shall be prohibited in the vicinity. Appropriate type fire extinguishers shall be provided by the Contractor and kept at the job-site during all operations.
- J. Sound Levels: Whenever the occupational noise exposure exceeds the maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protective devices.
 - 1. General sound levels for project shall be those which will not affect routine facility or neighborhood activities. Whenever levels are objectionable, they shall be adjusted as directed by the Water Division Supervisor.

PART 3 - COATING, PAINT & DISINFECTION MATERIALS

3.01 GENERAL

- A. Materials specified are those which have been evaluated for the specific service. Products of TNEMEC are listed to establish a standard of quality. Standard products other than the specified will be accepted when it is proved to the satisfaction of the Water Division Supervisor they are equal in composition, durability, usefulness, and convenience for the purpose intended. Substitutions will be considered, provided the following minimum conditions are met:
 - 1. All requests for substitution(s) shall carry full descriptive literature and directions for application, along with complete information on generic type, non-volatile content by volume.
 - 2. If the above mentioned data appears to be in order, the Water Division Supervisor may require that the Contractor provide certified laboratory data sheets showing the results of the complete spectrographic and durability tests accomplished on the proposed substitute. Test shall be accompanied by an independent testing laboratory satisfactory to the Water Division Supervisor and all costs incurred shall be borne by the Contractor.
 - 3. In any case, the Water Division Supervisor shall be the sole and final judge of the acceptability of any proposed substitution. Requests for substitutions must be approved in writing prior to date of bid.

- B. All materials shall be brought to the job-site in the original sealed containers. They shall not be opened or used until Owners representative has physically inspected contents and obtained necessary data from information printed on containers or label. Materials exceeding storage life recommended by the manufacturer shall be rejected.
- C. Flammability, toxicity, allergenic properties, and any other characteristic requiring field precautions shall be identified and specific safety practices shall be stipulated.
- D. All coating and paint shall be stored in enclosed structures to protect them from weather and excessive heat or cold. Flammable coatings and paints must be stored to conform to City, County, State, and Federal safety codes for flammable coating and paint materials. At all times coatings and paints shall be protected from freezing.
- E. Contractor shall use products of same manufacturer for all coats. Daily paint mixing must be limited to the use of the same batch numbers.

3.02 INTERIOR COATING MATERIALS

- A. Coating materials for interior surfaces shall conform to regulations and applicable requirements of local, State and Federal air pollution and health regulatory agencies. Products containing perchloroethylene, lead, chromium or zinc will not be permitted.
 - 1. Interior coatings will consist of a two component epoxy system, with immersion resistance and NSF61 approval. Devoe Bar Rust 233H is an approved epoxy coating.

3.03 EXTERIOR PAINT MATERIALS

- A. Encapsulating and bare steel prime coat materials for exterior surfaces shall be a 100% epoxy penetrating primer and shall conform to the regulations and applicable requirements of local, State and Federal air pollution regulatory agencies.
 - 1. Primer shall be TNEMEC 135 – 4.0 mils thickness.
- B. Top coat materials for exterior surfaces shall be a urethane and shall conform to the regulations and applicable requirements of local, state, and federal pollution regulatory agencies.
 - 1. Top coat shall be TNEMEC 73 – 2.0 – 3.0 mils thickness.

3.04 DISINFECTION MATERIAL

- A. Disinfection materials shall conform to all requirements of AWWA Standard C652-86.

PART 4 - EXECUTION

4.01 GENERAL

- A. All surface preparation, coating, and paint application shall conform to applicable standards of the Steel Structures Painting Council, American Water Works Association, and the manufacturer's printed instructions.
- B. All work shall be accomplished by skilled craftsmen qualified to accomplish the required work in a manner comparable with the best standards of practice. Continuity of personnel shall be maintained and transfers of key personnel shall be coordinated with the Water Division Supervisor.

The Contractor shall provide a supervisor to be at the work site during cleaning, application and disinfection operations. The supervisor shall have the authority to sign and change orders, coordinate work and make other decisions pertaining to the fulfillment of their contract.

- D. Contractor shall provide approved sanitary facilities for all Contractor personnel as no existing facilities will be available to the Contractor. Facilities shall be maintained during the project to complete standards established by Owner, and shall be removed prior to Contractors departure from the site at completion of the project.
- E. Dust, dirt, oil, grease or any foreign matter which will affect the adhesion or durability of the finished surface must be removed by washing with clean rags dipped in an approved commercial cleaning solvent, rinsed with clean water and wiped dry with clean rags.
- F. The Contractors coating and painting equipment shall be designed for application of materials specified and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air. Blotter test shall be accomplished at each start-up period and as deemed necessary by the Water Division Supervisor. Contractor's equipment shall be subject to approval of the Water Division Supervisor.
 - 1. Cleanliness of compressed air supply shall be verified daily, and as deemed necessary by Water Division Supervisor, by directing a stream of air, without abrasive, from the blast nozzle onto a white blotter or cloth for twenty seconds. If oil or water appears on the blotter or cloth, all traps and separators shall be blown down until subsequent twenty-second tests show no further oil or water.

- G. Application of the first coat shall follow immediately after surface preparation and cleaning within an eight hour working day. Any cleaned areas not receiving first coat within an eight hour period shall be re-blasted prior to application of first coat.
1. If dehumidification equipment is used, cleaned areas may have first coat applied at last shift of the week, provided dehumidification equipment has run continually during the complete week, and surface meets all requirements of the specification.
- H. Because of the presence of moisture and possible contaminants in the atmosphere, care shall be taken to ensure previously coated or painted surfaces are protected or re-cleaned prior to application of subsequent coat(s). Methods of protection and re-cleaning shall be approved by the Water Division Supervisor.
1. Project is subject to intermittent shutdown if, in the opinion of the Water Superintendent, cleaning, coating and painting operations are creating a localized condition detrimental to ongoing activities, personnel or adjacent property.
 2. In the event of emergency shutdown by the Water Division Supervisor, Contractor shall immediately correct deficiencies. All additional costs created by shutdown shall be borne by Contractor.

The Contractor shall provide, at his own expense, all necessary power for his operations under the scope.

4.02 SURFACE PREPARATION, GENERAL

- A. The latest revision of the following surface preparation specifications of the Steel Structures Painting Council shall form a part of this specification. (Note: An element of surface area is defined as any given square inch of surface).
- B.
1. Solvent Cleaning (SSPC-SP1): Removal of oil, grease, soil and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods, which involve a solvent or cleaning action.
 2. Hand Tool Cleaning (SSPC-SP2): Removal of loose rust, loose mill scale and other detrimental foreign matter present to degree specified by hand chipping, scraping, sanding and wire brushing.
 3. Power Tool Cleaning (SSPC-SP3): Removal of loose rust, loose mill scale and other detrimental foreign matter present to degree specified by power wire brushing, power impact tools or power sanders.

4. White Metal Blast Cleaning (SSPC-SP5): Blast cleaning to white metal cleanliness until 100% of the surface area is free of all visible residues.
 5. Commercial Blast Cleaning (SSPC-SP6): Blast cleaning until at least two-thirds of each element of surface area is free of all visible residue.
 6. Brush-off Blast Cleaning (SSPC-SP7): Blast cleaning to remove loose rust, loose mill scale, and other detrimental foreign matter present to the degree specified.
 7. Near-White Blast Cleaning (SSPC-SP10): Blast cleaning to near-white metal cleanliness, until at least ninety-five% of each element of surface area is free of all visible residues.
 8. Power Tool Cleaning to Bare Metal (SSPC-SP11): Power tool cleaning to produce a bare metal surface and to retain or produce a surface profile of at least one mil.
- C. Abrasive blasting nozzles shall be equipped with dead man emergency shut-off nozzles. Blast nozzle pressure shall be a minimum of 95 P.S.I. and shall be verified by using an approved nozzle pressure gauge at each start-up period or as directed by the Water Division Supervisor. Number of nozzles used during all blast cleaning operations must be sufficient to ensure timely completion of project as approved and directed by Water Division Supervisor.
- D. All blast hose connections shall be taped with duct tape prior to pressurizing. All taped connections shall be visually inspected for leaks within five minutes after start of blast cleaning operations and at the end of blast cleaning operations. Leaking connections shall be immediately repaired to prevent further damage.
- E. Interior blast cleaning for all surfaces shall be by dry method unless otherwise directed.
- F. Particle size of abrasives used in blast cleaning shall be that which will produce a 2.0 mil surface profile, or in accordance with recommendations of the manufacturer of the specified coating or paint system to be applied, subject to approval of the Water Division Supervisor.
- G. Abrasive used in blast cleaning operations shall be new, washed, graded and free of contaminants which would interfere with adhesion of coatings and paints and shall not be reused unless specifically approved by the Water Division Supervisor.
- H. During blast cleaning operations, caution shall be exercised to ensure existing coatings, paints, and insulation is not exposed to abrasive from blast cleaning.
- I. Blast cleaning from rolling scaffolds shall only be accomplished within confines of interior perimeter of scaffold. Reaching beyond limits of perimeter will be allowed

only if blast nozzle is maintained in a position which will produce a profile acceptable to the Water Division Supervisor.

- J. The Contractor shall keep the area of his work in a clean condition and shall not permit blasting materials to accumulate as to constitute a nuisance or hazard to the prosecution of the work of the operation of the existing facilities. Spent abrasives and other debris shall be removed at the Contractors expense, as directed by the Water Division Supervisor. If waste is determined to be hazardous, disposal by Contractor shall meet requirements of all regulatory agencies for handling and disposing of such wastes.
- K. Blast cleaned and coated/painted surfaces shall be cleaned prior to application of specified coatings or paints via a combination of blowing with clean dry air, brushing/sweeping and/or vacuuming as directed by the Water Division Supervisor. Air hose for blowing shall be at least ½” in diameter and shall be equipped with a shut-off device.
- L. Exterior surfaces shall be cleaned by water blast cleaning (hydro-blasting). Pressures shall be those determined by Water Division Supervisor to effectively perform removal of chalking, peeling/flaking paint or coating or other detrimental surface contaminants. It is expected that a minimum 2500 psi will be required to adequately perform the cleaning operations. Areas exhibiting corrosion products shall receive hand and/or power tool cleaning in accordance with SSPC-SP2 & SSPC-SP3. Special attention shall be given to the proper feathering of transition areas from bare steel to intact coatings.
- M. Interior Area Surface Preparation shall be abrasive blasted in accordance with SSPC-SP10 requirements, or power tool cleaned in accordance with SSPC-SP11 requirements.
- O. All tank wall welded seams need to be inspected, repaired and approved before coating is applied.

4.03 APPLICATION, GENERAL

- A. Coating and paint application shall conform to the requirements of the Steel Structures Painting Council Paint Application Specification SSPCPA1, latest revision, for Shop, Field and Maintenance Painting, the American Water Works Association, and the manufacturer of the coating and paint materials printed literature and as specified herein.
- B. Thinning shall only be permitted as recommended by the manufacturer and approved by the Water Superintendent, and shall not exceed limits set by applicable regulatory agencies.

1. If Contractor applied any coatings which have been modified or thinned to such a degree as to cause them to exceed established VOC levels, Contractor shall be responsible for any fines, costs, remedies, or legal action and cost which may result.
- C. Each application of coating and paint shall be applied evenly, free of brush marks, sags, runs and no evidence of poor workmanship. Care should be exercised to avoid lapping on glass or hardware. Coating and paint shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.
- D. Protective coverings or drop cloths shall be used to protect floors, fixtures, equipment, prepared surface and applied coatings or paints. Personnel entering reservoir or walking on exterior roof of reservoir shall take precautions to prevent damage or contamination of coated or painted surfaces. If required by Water Division Supervisor, personnel shall wear soft soled shoes, or shoe coverings approved by Water Division Supervisor. Care shall be exercised to prevent coating or paint from spattering onto surfaces which are not to be coated or painted. Surfaces from which such material cannot be removed satisfactorily shall be repainted or re-coated as required to produce a finish satisfactory to the Water Superintendent.
- E. All material shall be applied as specified herein.
- F. All welds and irregular surfaces shall receive a brush coat of the specified product prior to application of the prime coat. Coating/paint shall be brushed in multiple directions to ensure penetration and coverage, as directed by the Water Superintendent. These areas include, but are not limited to, welds, roof lap seams, nuts, bolts, ends and flanges of rafters, etc.
- G. At conclusion of each day of blast cleaning and coating operations, a 6" wide strip of blast cleaned substrate shall remain un-coated to facilitate locating point of origin for successive days blast cleaning operations. If dehumidification is employed, this 6" strip shall remain at any point of material application.
- H. Epoxy primed surfaces or other multi-component materials exposed to excessive sunlight or an excessive time interval beyond manufacturers recommended re-coat cycle, shall be scarified by Brush-off Blast Cleaning (SSPC-SP7) or methods approved by Water Division Supervisor, prior to application of additional coating or paint. Scarified coating shall have sufficient depth to assure a mechanical bond of subsequent coat.

4.04 SURFACE PREPARATION, SPECIFIC

- A. Interior roof, roof rafters, ring girders, columns, interior shell, floor, overflow, and all interior carbon steel surfaces.

Blast cleanliness = SSPC-SP10

Blast profile = 2.0 m minimum
Touch-up = SSPC-SP11

B. Exterior roof, exterior shell and all exterior appurtenances.

Cleanliness = Hydro-blast removing all chalking and all surface contaminants.

Corrosion Areas = Hand tool clean (SSPC-SP2)
Power tool clean (SSPC-SP3)

Note: The intact nature of the existing lead based alkyd coating will result in minimal paint removal. Any paint removed during hydro-blasting operations, hand tool cleaning or power tool cleaning, must be contained, tested, and disposed of accordingly. Strict adherence to the following codes of Federal Regulations will be required and verified:

1. 29 CFR 1910 OSHA General Industry Standards
2. 29 CFR 1910.134, Respiratory Protection
3. 29 CFR 1910.1000, Air Contaminants - Permissible Exposure Limits
4. 29 CFR 1910.1020, Employee Access to Exposure and Medical Records
5. 20 CFR 1926, OSHA Construction Industry Standards
6. 29 CFR 1926.59, Hazard Communication
7. 29 CFR 1926.62, Lead Exposure in Construction; Interim Final Rule
8. 40 CFR 261, Identification and Listing of Hazardous Waste
9. 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
10. 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste
11. 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

4.05 APPLICATION, SPECIFIC

A. Interior surfaces, including underside of roof, roof supports, walls and floor.

1. All interior surfaces shall, after completion of surface preparation, shall receive 2 coats of specified coating. Mil thickness shall be 4 - 6 mils per coat totaling 12-18 mils. A stripe coat on all weld and irregular surfaces shall be applied prior to the 2 full coats.

B. Exterior surfaces, including roof, shell, ladder, & appurtenances.

1. All exterior surfaces, after completion of surface preparation, shall receive one coat of the specified penetrating primer to a dry film thickness of 1 1/2 mils. Care must be exercised during this application to ensure 100% coverage of all intended surfaces.

2. All exterior surfaces, after completion of penetrating primer application and re-coat cure, shall receive one coat of the specified aliphatic urethane topcoat applied to a dry film thickness of 2 - 3 mils. Care must be exercised to ensure 100% coverage with no undercoat shadow-thru.

4.06 QUALITY CONTROL

- A. All epoxy and urethane paints & coating components shall be mixed in exact proportions specified by the manufacturer. Care shall be exercised to ensure all material is removed from containers during mixing and metering operations.
- B. All paints & coatings shall be thoroughly mixed, using an approved slow-speed power mixer until all components are thoroughly combined and are of a smooth consistency. Paints & coatings shall not be applied beyond pot-life limits or re-coat cycles specified by manufacturer.
- C. Thinners shall be added to paints & coatings only as required in accordance with manufacturers printed literature. Quantities of thinner shall not exceed limits set by applicable regulatory agencies.
- D. Application shall be directed by the manufacturer and approved by the Water Superintendent. Drying time between coats shall be strictly observed as stated in manufacturers printed instructions.
- E. Interior epoxy coats shall contain sufficient approved color additive as an indicator of coverage or the coats must be of contrasting color.
- F. Care should be exercised during spray operations to hold the spray nozzle perpendicular and sufficiently close to surfaces being coated to avoid excessive evaporation of volatile constituents and loss of material into the air or the bridging of cracks and crevices. Reaching beyond limits of scaffold perimeter will not be permitted. All overspray shall be removed as directed by the Water Division Supervisor.
 1. Paint shall not be applied when wind speed exceeds fifteen miles per hour or when damage to surrounding properties is likely.
- G. Upon completion of interior coating operations, after curing intervals in accordance with manufacturers recommendations, holiday detection shall be accomplished, using the specified instrument and in accordance with NACE Standard RP0188-88. Repair and retesting shall be accomplished as specified. Coatings under 20 mils will be detected using a Tinker-Razor M-1 67 1/2 V detector. Coatings at 20 mils and over shall be detected using a Tinker-Razor AP-W at a voltage setting as prescribed in the above noted NACE Standard. The Contractor is responsible for providing appropriate holiday detection equipment with calibration verification and in good condition. The Contractor is responsible for performing holiday detection testing in

strict accordance with the above noted NACE Standard and the presence of the Water Division Supervisor.

- H. All mixing, thinning, application and holiday detection of coating shall be accomplished in the presence of the Water Division Supervisor

4.07 FINAL CURING

- A. Upon completion and acceptance of applied coating system, Contractor shall furnish an approved exhaust fan or blower of sufficient capacity to ensure removal of solvent vapors during curing process. The fan or blower, after approval by Water Division Supervisor shall be installed as directed by the Water Division Supervisor and shall remain in continuous operation until coating is completely cured as determined by the manufacturer of the coating system.

Operation and maintenance of blower during curing operations shall be the responsibility of the Contractor. This responsibility will be limited to reasonable refueling intervals and spot verification of proper operation.

- B. In the event that an artificial heat source is employed to force cure the interior coating system, all activities must conform to the coating manufacturer's instructions. Specific information regarding initial cure time prior to heating, localized positioning of heating duct, maximum localized temperatures, and temperature curing curves must be addressed in writing and approved by the Water Division Supervisor.

4.08 DISINFECTION

Disinfecting of interior surfaces shall be accomplished in the presence of the Engineer in accordance with AWWA Standard C652, Section 4.2, Chlorination Method 2, as modified herein:

1. Disinfection shall be accomplished after protective coating has been applied to the interior surfaces and is totally cured.
2. Prior to disinfecting, the complete interior shall be cleaned by hosing with clean water. Residual water and contamination removed during washing process shall be flushed from reservoir. This operation shall be accomplished after completion of interior coatings work as directed by the Water Division Supervisor. All water usage by the Contractor shall be metered. Meters will be provided by the Owner.
 - a. If required to remove dust, spent abrasive, or other surface contaminants, all surfaces shall be cleaned with an approved cleaner or detergent applied via high pressure or hot solution method. Cleaned surfaces shall then be rinsed with clean water. Residual water and contaminants shall be flushed from reservoir. To

avoid any detrimental environmental impact Contractor is responsible for either transporting the waste water off-site with proper disposal or testing the waste water to ensure compliance with State, Federal, & Local requirements prior to on-site disposal.

3. After completion of curing and cleaning cycles, as noted above, all interior surfaces shall be jet washed with a chlorine or chloramine solution having a content of 200 P.P.M. Chlorine or chloramine solution which accumulates on the bottom shall be removed in accordance with all Federal, State, and Local standards. This chlorinated waste water will not be permitted to be discharged into the tank drain or into the storm drain system. Rinsing with clean water is not required unless directed by Owner.

4.09 CLEANUP

Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by the Water Division Supervisor. Coating spots upon adjacent surfaces shall be removed and the entire job-site cleaned. All damage to surfaces resulting from the work of this section shall be cleaned, repaired or refinished to the complete satisfaction of the Water Division Supervisor at no cost to the Owner.