

JORDAN VALLEY WATER CONSERVANCY DISTRICT

6000 West 4700 South Vault Modifications

Project #4135

October 8, 2019

DESCRIPTION OF WORK: This project consists of modifications to an existing reservoir valve vault located on the District's property at 6000 West 4700 South. The project includes replacement of corroded piping and valves, sandblast/recoating of piping, and sandblast/recoating a portion of the 1-million-gallon (MG) steel reservoir impacted by the work.

PROJECT SCHEDULE: The project shall be completed within 150 calendar days from the date of acceptance of the Award of Purchase Order. The piping improvements and the reservoir improvements shall be completed in order to have the reservoir placed back in service no later than April 1, 2020. If the work is not completed within the specified time frame, the bidder herein agrees to accept liquidated damages in the amount of \$250 per day.

RECEIPT OF BIDS: Sealed bids will be received by Jordan Valley Water Conservancy District, attention Kevin Rubow at the Administration Building located at 8215 South 1300 West, West Jordan, Utah 84088, until **3:00 pm, Tuesday, October 29, 2019**.

OBTAINING CONTRACT DOCUMENTS: The Contract Documents are entitled: "6000 West 4700 South Vault Modifications". All Contract Documents may be obtained on the District's website (www.jvwcd.org) beginning. Prospective bidders must register at the District's web site under the project to receive project notifications and addenda, if any. Contractors are required to check the District's web site for any addenda prior to submitting a responsive bid. Bids determined to be non-responsive may be rejected.

JVWCD project manager/contact person: Kevin Rubow
Telephone Number: (801) 565-4300
Email Address: KevinR@jvwcd.org

SITE OF WORK: 6011 West 4700 South, West Valley City, Utah, 84118.

PRE-BID SITE VISIT: A non-mandatory pre-bid site visit will be held at the Site of Work at **1:00 pm on Thursday, October 17, 2019**.

AWARD OF CONTRACT: An Award of Contract, if awarded, will be made within 30 calendar days of the opening of bids. Contract will be awarded based upon the lowest cost responsive bid.

BONDS: Bid bonds and Performance Bonds shall be required for any bid with a total cost greater than \$50,000.

BIDDER REQUIREMENTS: The bidder shall have a valid Utah Business license and a valid Utah Contractors license appropriate for the work. The successful bidder will have completed a minimum of three (3) projects of similar nature. The Owner shall be entitled to contact each reference listed by the contractor.

<u>Job Name/Description</u>	<u>Contact</u>
1.	
2.	
3.	

ADDRESS AND MARKING OF BID: The envelope enclosing the bid shall be sealed and addressed to the Jordan Valley Water Conservancy District and delivered or mailed to 8215 South 1300 West, West Jordan, Utah 84088. The envelope shall be plainly marked in the upper left-hand corner with the name and address of the bidder and shall bear the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids.

Electronic bids shall be submitted to the project manager as an email attachment with the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids in the subject line of the email.

PROJECT ADMINISTRATION: All questions relative to this project prior to the opening of bids shall be directed to the Project Manager for the project. It shall be understood, however, that no interpretations of the specifications will be made by telephone, nor will any "or equal" products be considered for approval prior to award of contract.

OWNER'S RIGHTS RESERVED: The Owner reserves the right to reject any or all bids, to waive any informality in a bid, and to make awards in the interest of the Owner.

Owner/ Engineer
Jordan Valley Water Conservancy District
Project Manager: Kevin Rubow
8215 South 1300 West
West Jordan, Utah 84088
Telephone: (801) 565-4300
Email: kevinr@jvwcd.org

JORDAN VALLEY WATER CONSERVANCY DISTRICT

INSTRUCTIONS TO BIDDERS

WARRANTY: The successful bidder shall warrant the equipment and installation to be free of defects in materials and workmanship for a period of one (1) year following satisfactory start-up and testing of the equipment.

INSURANCE REQUIREMENTS: Prior to awarding a purchase order the bidder must furnish certificates of insurance to include the following policies. The limits of liability for the insurance required in this project shall provide for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation

A. State: Utah Statutory

2. Comprehensive General Liability

A. Bodily Injury (including completed operations and products liability):

\$500,000	Each Occurrence
\$1,000,000	Annual Aggregate
or a combined single limit of	\$1,000,000

B. Property Damage liability insurance including Explosion, Collapse and Underground coverages where applicable.

C. Personal Injury, with employment exclusion deleted.

\$1,000,000	Annual Aggregate
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3. Comprehensive Automobile Liability:

A. Bodily Injury

\$500,000	Each Person
\$1,000,000	Each Occurrence

B. Property Damage:

\$500,000	Each Occurrence
or combined single limit of	\$1,000,000

BID SCHEDULE

<u>Item</u>	<u>Qty.</u>	<u>Units</u>	<u>Price</u>
1. Mobilization/Demobilization	1	LS	\$
2. Work Complete	1	LS	\$

Total: \$ _____

Bid total in words:

Bidder (Company name): _____

By: _____ Dated: _____
(Signature)

Name: _____ Title: _____
(Print)

The Bidder shall furnish the following information. Failure to comply with this requirement may render the Bid non-responsive and subject to rejection. Additional sheets shall be attached as required. No bid for the work will be considered from a bidder who does not hold an active license in good standing applicable to the type of work bid upon at the time of submission of the bid.

1. Contractor's name: _____

2. Contractor's address: _____

Contractor's Primary Contact: _____

Email address of Contractor's primary contact: _____

Contractor's telephone number: _____

3. Utah Department of Commerce Information
Business Entity Number: _____
Delinquent Date: _____

4. Contractor's Utah License Number: _____
Expiration Date: _____
Primary Classification: _____
Supplemental Classification held, if any: _____

5. Number of years as a contractor in work of this type:

6. As necessary, attach to your bid technical information showing compliance with the defined scope of work and/or technical specifications.

Project Requirements:

The work to be performed under this project shall consist of furnishing all labor, materials, and equipment necessary or required to complete the work in all respects as shown on the Drawings and as herein specified. All work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary to complete the construction of the work in good faith shall be performed, furnished, and installed by Contractor as though originally so specified or shown, at no increase in cost to Owner.

Project specifications are included on the Project Drawings and as herein specified in Section 09 90 10 – Reservoir Coatings and Paintings. Contractor is required to provide all necessary City construction permits as required to complete the work at its cost. Contractor is responsible to keep the work site in a clean and safe condition while completing the work. The Contractor shall comply with its written safety policy for all work which shall include air-quality testing and use of personal protective equipment. Sanitary equipment, including one portable toilet, shall be provided by the Contractor for the duration of the work.

Payment shall be made by the Owner upon monthly submittal of a PAYMENT APPLICATION AND CERTIFICATE (included). Payment will be made within 30 days of approval of work completed by the project manager. Change Orders (if any), will be per the District's standard form (included). Substantial Completion and Final Completion certificates (included) shall be presented by the contractor to the Owner's Project Manager for approval.

Schedule of Work:

The 1 MG reservoir is currently not in service and all work pertaining to the Piping Improvements and Reservoir Improvements shall be completed by April 1, 2020. There are multiple reservoirs at this site and Owner can shutdown the reservoirs' pipelines for limited periods between January 1, 2020 and April 1, 2020. All piping modifications shall be completed within this time frame and the shutdown periods are listed on the Yard Piping Modifications drawing, Sheet 4. Contractor shall coordinate shutdowns with Owner and give minimum 7-day notice. The shutdowns may not completely turn off the water, Contractor shall anticipate some of the valves leak and prepare for pumping and/or removal of bypass water.

AWARD OF PURCHASE ORDER

The Jordan Valley Water Conservancy District (Owner) hereby accepts your Bid dated _____ . In accordance with your Bid and the Owner’s Contract Documents dated _____ , the Owner has created a purchase order in the amount of \$ _____ for the project entitled “ _____ ”. The completion date is _____ calendar days from the Acceptance Date of this Award by you.

You should sign and return this Award of Purchase Order within 10 calendar days from the date of this notice to you.

Sincerely,

Alan E. Packard, PE
Assistant General Manager and Chief Engineer

Award Date

ACCEPTANCE OF AWARD

_____, a corporation qualified to do business in the State of Utah, hereby agrees to perform as specified in its Bid, the Owner’s Contract Documents, and this Award of Purchase Order.

Signature

Title

Acceptance Date

Attachments: Bid

PAYMENT APPLICATION AND CERTIFICATE No. _____

DATE: _____

SHEET _____ **OF** _____

PERIOD FROM _____ **TO** _____, 20____

PROJECT: _____

JVWCD PROJECT NO.: _____

CONTRACTOR: _____

ADDRESS: _____

ENGINEER: _____

1. ORIGINAL CONTRACT PRICE:..... \$ _____
2. NET CHANGE ORDERS APPROVED TO DATE:..... \$ _____
(Attach Summary Sheet)
3. REVISED CONTRACT AMOUNT:..... \$ _____
(Sum of Lines 1 & 2)
4. TOTAL VALUE OF WORK COMPLETED TO DATE \$ _____
..... (Attached Payment Breakdown)
5. PERCENT PROJECT COMPLETE: ____%
(Divide Line 4 by 3 and multiply by 100)
6. LESS AMOUNT RETAINED (5%) \$ _____
7. MATERIALS ON HAND..... \$ _____
(95% of Value, Listing Attached)
8. SUBTOTAL (Sum of Lines 4, Line 6 and Line 7) \$ _____
9. LESS PREVIOUS PAYMENTS \$ _____
10. CURRENT PAYMENT DUE: \$ _____
(Line 8 & 9)

Payment Application and Certificate No _____

SHEET _____ OF _____

CONTRACTOR'S Certification:

The undersigned CONTRACTOR certifies that: (1) all previous progress payments received from OWNER on account of work done under the Contract referred to herein have been applied to discharge in full all obligations of CONTRACTOR incurred in connection with work covered by prior Applications for Payment numbered 1 through inclusive; and, (2) title to all materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all liens, claims, security interests and encumbrances (except such as covered by bond acceptable to OWNER).

Dated: _____ CONTRACTOR: _____

By: _____

Recommendation:

This Application (with accompanying documentation) meets the requirements of the Contract Documents and payment of the amount due this application is recommended.

Dated _____
Project Representative

Dated _____
Project Manager

CHANGE ORDER

Order No: _____

Date: _____

Page ___ of ___

NAME OF PROJECT: _____

PROJECT NUMBER: _____

CONTRACTOR: _____

CONTRACT DATE: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

- 1)
- 2)
- 3)

Total Change to CONTRACT PRICE: \$

Original CONTRACT PRICE: \$

Current CONTRACT PRICE adjusted by previous CHANGE ORDER(S) \$

The new CONTRACT PRICE including this CHANGE ORDER will be \$

The CONTRACT TIME will be increased by _____ calendar days.

The date for Substantial Completion will be _____, 20__.

The date for Final Completion will be _____, 20__.

The Contractor agrees to furnish all labor and materials and perform all work as necessary to complete the change order items for the price named herein, which includes all supervision and miscellaneous costs. This change order constitutes full and mutual accord and satisfaction for all time and all costs related to this change. By acceptance of this change order the Contractor agrees that the change order represents an equitable adjustment to the Contract, and further agrees to waive all right to file a claim arising out of or as a result of this change. This document will become a supplement to the Contract, and all provisions will apply hereto, upon approval by the Owner.

**CHANGE ORDER
(CONTINUED)**

Order No. _____

Date: _____

Page ___ of ___

Accepted:

Contractor - _____ Date _____

Approved:

Owner - Jordan Valley Water Conservancy District _____ Date _____

**CONTRACTOR'S CERTIFICATE
OF
SUBSTANTIAL COMPLETION**

OWNER

TO: Jordan Valley Water Conservancy District
8215 South 1300 West
P. O. Box 70
West Jordan, Utah 84088-0070

PROJECT: _____

ATTENTION: _____

FROM: _____
Firm or Corporation

This is to certify that I, _____ am an authorized official of working in the capacity of _____ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been substantially performed and all materials used and installed to date are in accordance with, and in conformity to, the contract drawings and specifications. A list of all incomplete work is attached.

The Contractor hereby releases the Owner and its agents from all claims of and liability to the Contractor for anything done or furnished for or relating to the work, as further provided in Article 14.08B of the General Conditions, except demands against the Owner for the remainder of progress payments retained to date, and unresolved written claims prior to this date.

The contract work is now substantially complete, ready for its intended use, and ready for your inspection. You are requested to issue a Certificate of Substantial Completion.

SIGNATURE: _____

DATE: _____

**CONTRACTOR'S CERTIFICATE
OF
FINAL COMPLETION**

OWNER

TO: Jordan Valley Water Conservancy District
8215 South 1300 West
P. O. Box 70
West Jordan, Utah 84088-0070

PROJECT: _____

ATTENTION: Project Representative: _____

FROM: _____

Firm or Corporation

This is to certify that I, _____ am an authorized official of working in the capacity of _____ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been performed and all materials used and installed to date are in accordance with, and in conformity to, the contract drawings and specifications.

The Contract work is now complete in all parts and requirements, excepting the attached list of minor deficiencies and the reasons for each being incomplete to date, for which exemption from final payment requirements is requested in conformance to Article 14.09A of the General Conditions of our Contract (if no exemptions requested, write "none") _____. The work is now ready for your final inspection. The following items are required from the Contractor prior to application for final payment (such as O & M Manuals, guarantees, record drawings, etc.) are submitted herewith, if any:

I understand that neither the issuance by the Engineer of a Notice of Completion, nor the acceptance thereof by the Owner, shall operate as a bar or claim against the Contractor under the terms of the guarantee provisions of the Contract Documents.

SIGNATURE: _____

DATE: _____

TECHNICAL SPECIFICATIONS

SECTION 09 90 10
RESERVOIR COATINGS AND PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section covers the following work:
 - 1. Surface preparation, sealant application, and application of protective coatings on all interior surfaces of the tank, complete.
 - 2. Surface preparation and coating on all new and existing exterior surfaces, exterior conduit and appurtenances, and piping, complete.
 - 3. Clean-up, handling, proper storage, laboratory analyses of all hazardous and non-hazardous waste material, and disposal of all waste materials, complete.
- B. All coatings applied by contractor shall meet Utah Administrative Code R307 Environmental Quality, Air Quality requirements for volatile organic compounds (VOC) emissions.
- C. Prior surface preparation methods, cleanliness, and existing paint, corrosion, and mill scale removal is not known nor documented. Contractor shall be solely responsible for determining work effort, abrasive blast requirements, and any other factors that may affect work productivity as required for providing the specified surface preparation cleanliness; regardless of prior system preparation or coating application and at no additional cost to the Owner.
- D. It is the Contractor's responsibility to verify lead concentrations and other potentially hazardous constituents of existing coatings. The Contractor is fully responsible for all costs associated with monitoring, personnel protection, containment, coating removal, and disposal of coatings and associated debris regardless of metal concentrations in the coating and associated waste.
- E. It is the Contractor's responsibility to provide full containment, with zero emissions, of work areas to prevent site contamination and contamination of adjacent properties. Contractor shall be solely liable for all costs, including clean-up, and claims resulting from contamination of the site and adjacent properties.
- F. Contractor shall be solely liable for all costs, including clean-up and claims resulting from improper handling, transportation, and disposal of wastes.
- G. It is the Contractor's responsibility to provide heating, ventilation, and dehumidification equipment capable of maintaining the environmental conditions specified herein, continuously, once interior surface preparation begins, and continuing through final coating cure.

1.02 RESERVOIR DESCRIPTION

A. 1 MG Steel Reservoir – 6000 West 4700 South

1. Description:
 - a. Year Built: 1956
 - b. Construction Material: Welded steel, ground elevation tank
 - c. Diameter: 74 feet
 - d. Height: 32 feet from floor to tank knuckle
 - e. Roof: Pitched roof, with interior channel rafters and support columns
 - f. Interior Access: Roof hatch and two ground level manways
 - g. Roof Vent: One center roof vent.

1.03 WORK INCLUDED

- A. The CONTRACTOR shall furnish all materials, labor, equipment, and incidentals required to provide protective coating systems for the surfaces listed herein and not otherwise excluded.
- B. This section covers surface preparation, furnishing, and application of special protective coatings to new and previously coated surfaces, complete.
- C. Work includes interior surface preparation and coating, waste handling, containment, storage, and disposal. Specific work includes, but is not limited to the following:
 - a. Contractor shall remove any residual water remaining in the tank after draining is completed by the Owner and block or plug all pipe openings and drains to prevent debris from entering the openings.
 - b. Work includes surface preparation and recoating of all interior surfaces of the reservoir by abrasive blasting and applying the specified coating system including stripe coat.
 - c. Upon completion of all interior work, the Contractor shall clean the tank interior of all dust and residual abrasive media by pressure washing to the satisfaction of the Owner.
 - d. Disinfection of the tank will be performed by the Owner.
 - e. Disposal of all hazardous and non-hazardous waste generated from work, per local, State, and Federal regulations.
- D. The following items will not be painted:
 1. Any code-required labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.
 2. Signs and nameplates.
 3. Galvanized steel grating.
 4. PVC and galvanized electrical conduits.
 5. Stainless Steel Piping.

1.04 ABBREVIATIONS

ANSI	American National Standards Institute
AWWA	American Water Works Association
FRP	Fiberglass Reinforced Plastic
HCl	Hydrochloric Acid
MDFT	Minimum Dry Film Thickness
MDFTPC	Minimum Dry Film Thickness Per Coat
mil	Thousandths of an Inch
MIL-P	Military Specification - Paint
OSHA	Occupational Safety and Health Act
PSDS	Paint System Data Sheet
SFPG	Square Feet Per Gallon
SFPGPC	Square Feet Per Gallon Per Coat
SP	Surface Preparation
SSPC	Steel Structures Painting Council
TCLP	Toxic Characteristic Leachate Procedure (EPA Method 1311)

1.05 REFERENCES

A. American Water Works Association (AWWA)

AWWA D100 Standard for Welded Steel Tanks for Water Storage
AWWA D102 Coating Steel Water-Storage Tanks

B. ASTM International (ASTM)

ASTM D16 Terminology Relating to Paint, Varnish, Lacquer, and Related Products
ASTM D335 Test Method for Measuring Adhesion by Tape Test
ASTM D4263 Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
ASTM D4541 Test Method for Pull Off Strength of Coatings Using Portable Adhesion-Testers
ASTM D1005 Test for determining dry film thickness
ASTM D4417 Test for determining surface profile
ASTM E2501 Light Source Products for Inspection of Fluorescent Coatings

C. NACE International (NACE)

NACE SP0188-2006 Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
NACE SP0288-2004 Inspection of Linings on Steel and Concrete

D. NSF International (NSF)

ANSI/NSF 61-2009 Drinking Water Components – Health Effects

E. The Society for Protective Coatings (SSPC)

Steel Structures Painting Manual (Volume 1 and Volume 2, including Commentary Sections and Appendices)

SSPC AB 1 Mineral and Slag Abrasives
SSPC AB 2 Cleanliness of Recycled Ferrous Metallic Abrasive
SSPC AB 3 Newly Manufactured or Re-Manufactured Steel Abrasives
SSPC PA 1 Shop, Field, and Maintenance Painting
SSPC PA2 Measurement of Dry Coating Thickness with Magnetic Gages
SSPC SP 1 Solvent Cleaning
SSPC SP 10 Near-White Metal Blast Cleaning
SSPC SP 5 White Metal Blast Cleaning
SSPC SP 13 Surface Preparation of Concrete
SSPC SP COM Surface Preparation Commentary for Steel and Concrete Substrates
SSPC VIS 1 Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
SSPC Guide 6 Guide for Containing Debris Generated During Paint Removal Operations
SSPC Guide 7 Guide to the Disposal of Lead-Contaminated Surface Preparation Debris

SSPC TU7	Conducting Ambient Air, Soil, and Water Sampling During Surface Preparation and Paint Disturbance Activities
SSPC-TU11	Inspection of Fluorescent Coating Systems
SSPC Guide 12	Guide for Illumination of Industrial Painting Projects
SSPC TR 3	Dehumidification and Temperature Control During Surface Preparation, Application, and Curing for Coatings/Linings of Steel Tanks, Vessels, and Other Enclosed Spaces

1.06 QUALITY ASSURANCE

A. Coating Work Plan:

1. Provide procedures for all phases of coating operations, including planned work, rework, repair, inspection, and documentation. Address mobilization and setup, surface preparation, coating application, coating initial cure, tracking and correction of non-compliant work, and demobilization. For each process, provide procedures that include appropriate work instructions, material and equipment requirements, personnel qualifications, controls, and process verification procedures. Provide procedures for inspecting work to verify and document compliance with contract requirements, including inspection forms and checklists, and acceptance and rejection criteria.
2. Provide procedures for correcting non-compliant work. Detailed procedures are required in advance to avoid delays in meeting overcoat windows as well as to avoid delays in production. Provide procedures for repairing defects in the coating film, such as runs, drips, sags, holidays, overspray, as well as how to correct coating thickness non-compliance, any other areas of repair or rework that might be adversely affected by delays in preparing and approving new procedures.

B. Work Plan and Design for Dehumidification and Temperature Control:

1. Provide Dehumidification and Temperature Control design and calculations, equipment information, procedures for operation and maintenance, process of verification of equipment effectiveness, and procedure for assuring operation of equipment outside of normal work hours.

C. Test Reports:

1. Abrasive Sample Test Reports: Submit test results from independent laboratory of representative samples of each abrasive to be used on the jobsite. Samples must have been tested within the last three years.

D. Qualifications:

1. Epoxy Coating Materials: Provide manufacturer's certification that the epoxy coating materials are certified in accordance with ANSI/NSF

Standard 61; indicating product application limits on size of tank or piping, dry film thickness, number of coats, specific product tested, colors certified, and approved additives.

2. All Coating Materials: Provide manufacturer's certification that the coatings conform to the State of Utah VOC rules and any limitations regarding the use of thinners and additives.

E. Inspection

1. Engineer or Owner's representative has full authority to stop work for non-conformance with these specifications.
2. Inspect and provide substrate surfaces prepared in accordance with these specifications and the printed directions and recommendations of paint manufacturer whose product is to be applied. Provide Engineer minimum 3 days' advance notice prior to start of surface preparation work or coating application work.
3. Perform work only in the presence of Engineer, unless Engineer grants prior approval to perform such work in Engineer's absence. Approval to perform work in the Engineer's absence is limited to the current day unless specifically noted to extend beyond the completion of the workday.
4. Inspection by the Engineer, or the waiver of inspection of any particular portion of the work, shall not be construed to relieve the Contractor of responsibility to perform the work in accordance with these specifications.

1.07 PRODUCT DATA

A. Product Data Sheets:

1. For each paint system used herein, furnish a Paint System Data Sheet (PSDS), Technical Data Sheets, and paint colors available (where applicable) for each product used in the paint system, except for products applied by equipment manufacturers. A sample PSDS form is appended at the end of this section.
2. Where ANSI/NSF Standard 61 approval is required, submit ANSI/NSF certification letter for each coating in the system indicating product application limits on size of tank or piping, dry film thickness, number of coats, specific product tested, colors certified, and approved additives.
3. The required paint system information shall be submitted on a system-by-system basis.
4. Indiscriminate submittal of manufacturer's literature is not acceptable.
5. Submit color samples for exterior paint systems to be selected by Owner.

B. Blast Abrasives

1. Provide TCLP test data for lead and other regulated heavy metals in non-recyclable abrasive blast media to be used on the project.
2. Acceptable abrasive test data shall indicate the abrasive manufacturer, location of manufacture, test date, and media gradation and type. Surface preparation will not be permitted to begin until acceptable test data has been submitted.

C. Sealant Application Instructions

1. Submit manufacturer's printed instructions including detailed mixing and application procedures, minimum and maximum application temperatures, and curing procedures. Provide Materials Safety Data Sheets (MSDS) for materials to be used at the job site.

D. Coating System Application Instructions

1. Submit manufacturer's printed instructions including storage temperature range, detailed mixing and application procedures, number and types of coats required, minimum and maximum application temperatures, and curing procedures. Provide Materials Safety Data Sheets (MSDS) for materials to be used at the job site.
2. For each paint system used herein, furnish a Paint System Data Sheet (PSDS), Technical Data Sheets, and paint colors available (where applicable) for each product used in the paint system, except for products applied by equipment manufacturers. A sample PSDS form is included at the end of this section.
3. The required paint system information shall be submitted for each coatingsystem specified.
4. Indiscriminate submittal of manufacturer's literature only is not acceptable.
5. Submit color samples for exterior paint systems.

1.08 PAINT DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint to the project site in unopened containers that clearly show the designated name, date of manufacture, color, batch number, and name of manufacturer.
- B. Store paints in a suitable protected area that is temperature controlled to maintain paint temperatures within the storage range recommended by the paint manufacturer.
- C. Coating materials found on site that are exposed to conditions outside the manufacturer's recommended temperature storage range will be rejected and removed from site at the Contractor's expense.

1.09 WARRANTY

- A. The Contractor and coating manufacturer shall jointly and severally warrant to the Owner and guarantee the work under this section against defective workmanship and materials for a period of 2 years commencing on the date of final acceptance of the work.
- B. Defective workmanship shall be determined during the two-year inspection to be performed within the warranty period. Contractor shall attend the warranty inspection. Any unsatisfactory coating application observed, or visible rusting

shall be repaired by the Contractor in accordance with the written instructions of the coating manufacturer and approved by the Engineer.

- C. The warranty for coating repairs at the 1MG 4700 South 6000 West Reservoir Coating shall be limited to the work performed by the Contractor under these Contract Documents.

PART 2 PRODUCTS

2.01 ABRASIVE

A. General

1. All abrasive utilized on the project shall be new and arrive on site in sealed containers.
2. Abrasive shall be selected to meet the requirements of the specified coating systems, requirements of SSPC AB1, 2, and 3, and regulatory requirements.
3. The abrasive for interior surfaces shall be commercially available, non-metallic expendable abrasive or reusable steel grit.
4. Recyclable abrasive used on the exterior shall not be used on the interior of the reservoirs.
5. Abrasive utilized for the removal of lead-based coatings shall be recyclable steel grit.
6. All recyclable abrasive utilized on the project shall be tested and disposed of in accordance with local, State, and Federal regulations.

2.02 PAINT MATERIALS

A. General

1. Products shall meet federal, state, and local requirements limiting the emission of volatile organic compounds. Specific information may be secured through the local office of the Air Pollution Control Officer.
2. Coatings shall meet the State of Utah's administrative Code R307 Environmental Quality, Air Quality requirements for volatile organic compounds (VOC) emissions.
3. All coating system materials including Primer, Stripe, Intermediate, and Finish Coats shall be produced by the same manufacturer.
4. Thinners, Cleaners, Driers, and Other Additives: As recommended by paint manufacturer of the particular coating. Where coatings are required to meet ANSI/NSF Standard 61, addition of thinners, driers, and other paint additives not approved under the ANSI/NSF certification letter will not be permitted without written approval from the Engineer.

B. Primer for Exterior Coating on Steel Water Tanks- Polyamide Epoxy Coating

1. Provide a commercially available, two-component, low VOC (<250g/L), high build polyamide epoxy coating for prime coat of exterior coating system.

The coating shall be suitable for application in a single, even coats of 4-6 mils dry film thickness (DFT).

2. Epoxy Coating Performance Characteristics
 - a. Adhesion to Steel (ASTM D4541, Type V): >1,600 psi
 - b. Abrasion Resistance (ASTM D4060): <120mg loss
3. Volume solids shall be >70%.
4. Coating shall have a maximum recoat time of at least 90 days at 77 degrees F.
5. Minimum coating application temperature shall be 40 degrees F or less.
6. Paint and Coatings Manufacturers
 - a. Sherwin Williams Macropoxy 5500LT
 - b. or approved equal

C. **Top Coats for Exterior Coating on Steel Water Tanks** - Aliphatic Acrylic Polyurethane for Intermediate and Finish Coats (Semi-gloss)

1. Provide a commercially available two-component, low VOC (<250g/L), aliphatic or acrylic based polyurethane, with semi-gloss finish for exterior finish coat suitable for application at 3-4 mils DFT.
2. Polyurethane Coating Performance Characteristics
 - a. Adhesion to Steel (ASTM D4541, Type V): >1,000 psi
 - b. Abrasion Resistance (ASTM D4060): <100mg loss
 - c. Direct Impact Resistance (ASTM D2794): >=28 in. lb.
 - d. Flexibility (ASTM D522, 180-degree bend, 1/8" mandrel): Pass
3. Coating shall have a maximum recoat time of at least 7 days at 120 degrees F.
4. Minimum coating application temperature shall be 40 degrees F or less.
5. Paint and Coatings Manufacturers
 - a. Sherwin Williams Hi-Solids Polyurethane 250
 - b. or approved equal

D. **Repair Coating System for Interior of 1MG 4700 South 6000 West Steel Water Tank** – NSF Certified Polyamide Epoxy for Intermediate and Finish Coats

1. Provide PPG Epoxy to match existing coating system.

E. Paint and Coatings Manufacturers

1. Carboline Coatings Company, St. Louis, MO.
2. ICI Devoe Coatings Company, Louisville, KY.
3. International Coatings, Louisville, KY
4. Pittsburgh Paints (PPG), Pittsburgh, PA
5. Sherwin Williams, Cleveland, OH
6. Tnemec Coatings, Kansas City, MO
7. Wasser Coatings, Seattle, WA

2.03 SEALANT MATERIAL

- A. Industrial grade, two component, 100% solids, polyurethane based, elastomeric sealant material that has a minimum history of 10 years acceptable service in

water tanks. Sealant shall be compatible with the epoxy coating and suitable for direct application to prepared steel surfaces. Sealant shall be certified in accordance with ANSI/NSF Standard 60 and 61.

- B. Sealant Performance Characteristics:
 - 1. Tensile Strength (ASTM D412): >150 psi
 - 2. Elongation (ASTM D412): >500%
 - 3. Hardness, Shore A (ASTM D2240): 25-30
 - 4. VOC: 0.00 lb./gal

- C. SEALANT MANUFACTURERS:
 - 1. Polyspec, Houston, TX
 - 2. DuPont Chemical Co., Wilmington, DE
 - 3. Morton International, Chicago, IL
 - 4. Sika Corporation, Lyndhurst, NJ
 - 5. or approved equal

2.04 PAINT COLORS

- A. Provide colors as selected by the Owner.

- B. Formulated with colorants free of lead, lead compounds, or other materials that might be affected by the presence of hydrogen sulfide or other gases likely to be present at the project.

- C. Where more than one coat of a material is applied within a given system, alternate color to provide a visual reference that the required number of coats has been applied. Stripe coats shall be alternated in color similar to a full coat. Final coat color shall be as selected by Owner. Each coating color used inside the tanks shall be certified in accordance with NSF 61 for contact with potable water in water storage tanks.

- D. Blending of two colors for visual color reference in multiple coat systems will not be permitted without prior approval of the Engineer.

- E. Touch-up of interior and exterior coatings to be matched to existing coating color.

- F. Proprietary identification of colors is for identification only. Any authorized manufacturer may supply matches.

2.05 COATING INSPECTION INSTRUMENTS

- A. Contractor shall provide new, calibrated coating inspection equipment and calibration standards for each active work site.

- B. Provide a magnetic type or electronic dry film thickness gauge to test coating

thickness specified in mils, as manufactured by:

1. DeFelsko Corp., Anaheim, CA, Positector 6000
 2. Elcometer, Rochester Hills, MI, Model 345
 3. Test Coat, Gettysburg, PA, Quanix 1200
 4. Or equal.
- C. Light Source Products for Inspection of Fluorescent Coatings
1. Provide two (2) inspection lights in accordance with ASTM E2501.
 2. One light shall become the property of the Owner at the completion of the project.
- D. Provide an electrical low voltage, wet sponge holiday detector, with audible alarm, to test finish coats for holidays and discontinuities. Provide non-sudsing wetting agent as recommended by manufacturer. Holiday detectors shall be as manufactured by:
1. Tinker and Razor, San Gabriel, CA, Model M1-AC.
 2. Elcometer, Rochester Hills, MI, Model 269
 3. Or equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Surface preparation and coating application shall be in conformance with these specifications and the coating manufacturer's written instructions and written recommendations of the manufacturer's technical representative. Where conflicts occur between the manufacturer's recommendations and these specifications, the more stringent of the two shall apply unless approved otherwise by the Engineer.
- B. Surface Preparation Inspection:
1. Provide Engineer minimum 3 days' advance notice prior to start of surface preparation work or coating application work.
 2. Perform such work only in the presence of Engineer, unless Engineer grants prior approval to perform such work in Engineer's absence.
- C. For coatings subject to immersion, obtain full cure for completed system. Consult coatings manufacturer's written instructions for cure requirements. Do not immerse coating for any purpose until completion of curing cycle.

3.02 REGULATORY REQUIREMENTS

- A. Meet federal, state, and local requirements limiting the emission of volatile organic compounds and worker exposures.
- B. Protect workers and comply with applicable federal, state, and local air pollution

and environmental regulations for surface preparation, blast cleaning, disposition of spent aggregate and debris, coating application and dust prevention including, but not limited to the following Acts, Regulations, Standards, and Guidelines:

1. Clean Air Act
 2. National Ambient Air Quality Standard
 3. Resource Conservation and Recovery Act (RCRA)
 4. OSHA Interim Final Rule on Lead Exposure in Construction
 5. SSPC Guide 6I
 6. SSPC Guide 7I
- C. Comply with applicable federal, state, and local regulations for confined space entry.
- D. Provide and operate equipment that meets explosion proof requirements.

3.03 ENVIRONMENTAL CONDITIONS

- A. Do not perform abrasive blast cleaning whenever the relative humidity exceeds 85 percent, whenever surface temperature is less than 5 degrees F above the dew point of the ambient air.
- B. Surface preparation power tools and blast equipment shall contain dust collection equipment that will prevent discharge of dust particles into the atmosphere.
- C. Do not apply paint when:
1. Surface temperatures exceed the maximum or minimum temperature recommended by the paint manufacture.
 2. In dust, smoke-laden atmosphere, damp or humid weather, or under conditions which could cause icing on the metal surface.
 3. When it is expected that surface temperatures will drop below 5 degrees above dew point within 8 hours after application of coating.
 4. Ambient and steel temperatures are expected to increase above the maximum allowable coating temperatures, specified by the coating manufacturer, before the minimum recoat time is reached.
- D. Coatings impacted by precipitation and environmental conditions outside the coating manufacturers application parameters, within 8 hours of application, shall be subject to full removal.
- E. CONTRACTOR shall use the required dehumidification and temperature controls and any additional means determined by the Contractor to be necessary, to assure that temperatures meet the coating application requirements for all work on the interior of the 1MG Backwash Tank.

3.04 CONTAINMENT SYSTEM FOR REMOVAL OF EXISTING LEAD-BASED COATINGS

- A. CONTRACTOR shall provide full containment of all work areas for containing and controlling debris, dust, and all discharges, and for collecting and disposing of all abrasive blast debris. Type and Class of containment system shall be dependent on Contractor's lead based coating removal approach and shall be designed accordingly, to provide zero emissions from the work area and to prevent site contamination and contamination of adjacent properties.
- B. The containment system shall, at a minimum, be in accordance with Occupational Monitoring of Area Emissions for Lead and per local, state, and federal regulatory requirements, except where specified or required by law to be more stringent.
- C. CONTRACTOR shall design and fabricate containment systems as required to meet the requirements of the guidelines and the following specific containment objectives:
 - 1. Containment and collection of all paint and debris generated by surface preparation.
 - 2. 100% containment with zero dust emissions.
 - 3. Environmental control of conditions within the containment as required with dehumidification equipment and temperature controls, if necessary.
 - 4. Ventilation air to the containment shall be fully contained and treated by dust collection equipment. Dust collection socks or bags will not be acceptable.
- D. Contractor shall perform continuous air monitoring outside the containment areas, as outlined in the Contractor's monitoring plan, to verify the effectiveness of the containment system and document no releases have occurred during the Work.
- E. Daily maintenance requirements of the equipment shall be documented in writing and posted near the equipment for review by the ENGINEER.
- F. Re-blasting of flash rusted metal surfaces or removal of damaged coatings, as a result of equipment malfunction, shutdown, or other events that result in the loss of environmental control, will be at the sole expense of the CONTRACTOR.

3.05 VENTILATION AND ILLUMINATION

- A. Adequate illumination shall be provided while work is in progress. Whenever required by the inspector, the Contractor shall provide additional illumination and necessary support to illuminate all areas to be inspected. The inspector shall determine the level of illumination necessary for inspection purposes.
- B. Ventilation shall be used to control potential dust and hazardous conditions within the tank. Ventilation flow rates shall be in accordance with OSHA regulations and as required to reduce air contamination to non-hazardous

conditions.

- C. Contractor shall maintain adequate ventilation during coating curing as recommended by the coating manufacturer.

3.06 EQUIPMENT USED IN TANK

- A. Equipment used in the tanks after surface preparation begins shall not leave any oily residue from exhaust or other sources.
- B. Internal combustion driven equipment, other than that powered by natural or bottled gas, shall not be used.

3.07 SURFACE PREPARATION

A. Surface Standard

- 1. Inspect surfaces to be coated, and select plate with similar properties and surface characteristics for use as a surface standard. Blast clean one or more two foot square steel panels as specified in paragraph Metal Surface Preparation. Record surface profile, degree of cleanliness, blast nozzle type and size, air pressure at nozzle and compressor, distance of nozzle from panel, and angle of blast to establish procedures for blast cleaning. When the surface standard complies with all specified requirements, seal with a clear coat protectant. Use the surface standard for comparison to abrasive blasted surfaces throughout the course of work.

B. Metal Surface Preparation:

1. General:

- a. Do not perform a surface preparation blast prior to submission of samples. Workmanship for metal surface preparation as specified shall meet current Steel Structures Painting Council (SSPC) specifications as follows:
 - (1) Solvent Cleaning: SP 1
 - (2) Hand Tool Cleaning: SP 2
 - (3) Power Tool Cleaning: SP 3
 - (4) White Metal Blast Cleaning: SP 5
 - (5) Commercial Blast Cleaning: SP 6
 - (6) Brush-Off Blast Cleaning: SP 7
 - (7) Near-White Blast Cleaning: SP 10
 - (8) Bare Metal Power Tool Cleaning: SP 11
 - (9) Commercial Grade Power Tool Cleaning: SP 15
- b. Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning", or similar words of equal intent are used in these specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC specifications listed

- above.
 - c. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacu-blast methods may be required. Coating manufacturers' recommendations for wet blast additives and first coat application shall apply.
2. Welds and adjacent areas:
- a. Prepared such that there is:
 - (1) No undercutting or reverse ridges on the weld bead.
 - (2) No weld spatter on or adjacent to the weld or any other area to be painted.
 - (3) No sharp peaks or ridges along the weld bead.
 - b. Grind embedded pieces of electrode or wire flush with the adjacent surface of the weld bead.
3. Preblast Cleaning Requirements:
- a. Cap or seal all inlet, outlet, or overflow piping inside tanks prior to beginning any surface preparation or cleaning work to prevent entry of foreign material into the piping systems.
 - b. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
 - c. Cleaning methods: Steam, open flame, high pressure hot or cold water (3,000 psi or greater) with appropriate detergent additives followed with clean water rinsing.
 - d. Clean small isolated areas as above or solvent cleaned with suitable solvents and clean cloths.
 - e. Repair corrosion pits by arc welding and grinding flush with the metal surface as directed by the Engineer. Weld undercutting, pits, slag, holes, or splatter shall be removed or corrected before repairs are acceptable.
 - f. Grind metal protrusions, deformations, and welds on interior of tanks flush with the metal surface where directed by the Engineer.
4. Abrasive Blasting Equipment
- a. Use abrasive blasting equipment of conventional air, force-feed, or pressure type. Maintain a minimum pressure of 95 psig at nozzle. Confirm that air supply for abrasive blasting is free of oil and moisture when tested in accordance with ASTM D 4285. Test air quality at each startup, but in no case less often than every five operating hours.
5. Abrasive Blast Cleaning Requirements:
- a. It is the CONTRACTOR's responsibility to determine the original steel conditions in selecting the abrasive and equipment required for

- achieving the specified surface profile and cleanliness.
- b. Type of Equipment and Speed of Travel: Designed to obtain specified degree of cleanliness.
 - c. Blast profile on interior and exterior of reservoirs shall be of a sharp, jagged nature, and angular, with no evidence of a polished surface. **Peened surface patterns, such as those obtained from shot blasting, are not acceptable for interior or exterior surfaces.**
 - d. Select type and size of abrasive to produce a surface profile that meets the coating manufacturer's recommendations for the particular coating to be applied or not less than 20 percent of the specified coating thickness, whichever is more stringent.
 - e. Abrasive blast surface preparation work on interior surfaces coated with lead paint shall be with recyclable abrasive and reclamation equipment unless specified otherwise. Contractor may use conventional blast equipment with non-recyclable abrasive with existing coating where lead paint has been previously removed by chemical stripping upon approval by the Engineer.
 - f. Removal of existing lead based paint on the exterior of reservoirs shall be by abrasive blast using recyclable abrasive and containment. Contractor shall comply with the requirements as specified under Lead Paint Removal and Collection this section.
 - g. Dust collection equipment shall be used to collect dust within the tank by maintaining a negative pressure during and following abrasive blasting. Dust shall be collected and contained with appropriate dust collection equipment. Dust and lead particle emissions shall not exceed levels permitted by EPA, State, or local regulations or result in contamination of the project site or adjacent properties.
 - h. Collect and store all paint and abrasive blast debris in accordance with the current EPA storage requirements for hazardous waste materials in effect at the time of disposal.
 - i. Meet applicable federal, state, and local air pollution control regulations for blast cleaning and disposition of spent, non-hazardous aggregate and debris.
6. Post-Blast Cleaning and Other Cleaning Requirements:
- a. Clean surfaces of dust and residual particles from or other method prior to painting.
 - b. Vacuum clean enclosed areas and other areas where dust settling is a problem.
 - c. Horizontal surfaces subject to dust settlement, such as welds, floors, and flanges on rafters and girders, shall be cleaned again by dry air blast and vacuum immediately preceding paint application.
 - d. Remove all spent steel grit from floor, corners, painter's rail, and other areas as necessary using a magnetic broom and dry air blasting.
 - e. Paint cleaned surfaces the same day they are approved, unless dehumidification equipment is provided and properly operated on a continuous basis throughout surface preparation. Re-blast surfaces that have started to rust before they are painted.

- f. Contractor shall apply the prime coat at a minimum thickness as required to fully cover surface profile plus one mil.
- 7. Pre-Application Testing for Surface Cleanliness
 - a. Apply coatings to dust free surfaces. To test surfaces, apply strip of clear adhesive tape to surface and rub onto surface with finger. When removed, the tape should show little or no dust, blast abrasive, or other contaminant. Reject contaminated surfaces, clean by vacuum cleaning, and retest.
 - b. Test surfaces at rate of three tests for the first 1000 square feet plus one test for each additional 1000 square feet or part thereof. Provide two additional tests for each failed test or questionable test.
 - c. Attach test tapes to Daily Inspection Reports.
 - 8. Solvent Cleaning:
 - a. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by the use of solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods which involve a solvent or cleaning action.
 - b. Method shall meet SSPC-SP 1 requirements.
- C. Lead and Hazardous Paint Removal and Collection:
- 1. Contain and collect paint debris generated during all activities that disturb lead based paint.
 - 2. Type and Class of containment system will be dependent on Contractor's lead based coating removal approach and shall be designed accordingly, to provide zero emissions from the work area and to prevent site contamination and contamination of adjacent properties.
 - 3. Conditions immediately outside of containment shall be monitored by the Contractor.
 - 4. There shall be zero dust emissions from the containment area during surface preparation. The presence of dust emissions shall be cause for suspension of work until Contractor cleans up contamination and reconfigures containment.
 - 5. Surface preparation work can be temporarily terminated by the Engineer should the containment system or weather conditions result in unacceptable dust emissions.
 - 6. Following the project, the Contractor and Engineer shall collect post-construction soil samples around the perimeter of the tank to determine the presence of soil contamination. Contractor shall submit post-construction samples for soil analysis of Total Lead and TCLP Lead.
 - 7. The ground (soil) is considered to have been adversely impacted by project activities based on increases over the pre-job lead concentration level. An impact is considered to have occurred if the post-job total lead

concentration results in an increase of 100 ppm or more over the pre-job total lead concentration.

8. Soil impacted by lead contamination will be remediated to pre-job lead concentration levels at the Contractor's expense. Contractor shall be responsible for the costs associated with confirming the site is remediated.
9. Waste generated from high pressure cleaning and rinsing shall be collected on site and treated prior to disposal. If applicable, the CONTRACTOR shall be responsible for obtaining necessary discharge permits from applicable local agencies. The CONTRACTOR shall provide the Project Representative a copy of the approved discharge permit prior to discharging any wastewater.
10. Lead paint dust and debris shall be contained in accordance with SSPC Guide 6I, Class 5 containment, minimum.
11. Locally collect paint debris generated during hand or power tool cleaning. Collection shall be a combination of containment and vacuum collection equipment at the point of generation.
12. Dust emissions from the containment area during surface preparation shall be visually monitored for compliance and documented with continuous air monitoring.
13. Surface preparation work can be temporarily terminated by the ENGINEER should the containment system or weather conditions result in unacceptable dust emissions.
14. The CONTRACTOR in the presence of the ENGINEER shall collect representative soil samples from each project site for establishment of background levels of lead or other hazardous contaminants. The ENGINEER will retain samples for 60 days following the completion of the project. The OWNER will perform testing of the soil samples in the event the site is subject to contamination.

3.08 PROTECTION OF MATERIALS NOT TO BE PAINTED

- A. Contractor shall be fully responsible for protection of the North Jordan Canal during all work activities and coordinating with North Jordan Irrigation Company personnel during the Work.
- B. Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted.
- C. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.
- D. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.
- E. CONTRACTOR shall be responsible for selection of coating manufacturer approved surface preparation method and containment of surface preparation generated debris and waste, that will not damage OWNER's equipment, impact daily site operations, impact traffic, or impact the North Jordan Canal.

3.10 APPLICATION SAFETY

- A. Perform painting in accordance with recommendations of the following:
 - 1. Paint manufacturer's instructions.
 - 2. NACE recommended practices contained in the publication, Manual for Painter Safety.
 - 3. Federal, state, and local agencies having jurisdiction.
- B. Contractor will be solely and completely responsible for condition of the project site, including safety of all persons (including employees) and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. Safety provisions will conform to U.S. Department of Labor, Occupational Safety and Health Act, any equivalent state law, and all other applicable federal, state, county, and local laws, ordinances, and codes.
- C. Contractor will comply with all safety-training requirements for this project.

3.11 PAINT MIXING

- A. Multiple-component coatings:
 - 1. Prepare using all of the contents of the container for each component as packaged by the paint manufacturer.
 - 2. **No partial batches will be permitted.**
 - 3. Multiple-component coatings that have been mixed shall not be used beyond their pot life.
 - 4. Allow mixed materials to stand for required induction time based on its temperature.
 - 5. Provide small quantity kits for touch up painting and for painting other small areas.
 - 6. Mix only components specified and furnished by the paint manufacturer and approved under the ANSI/NSF Standard 61 certification, where applicable.
 - 7. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.
 - 8. Addition of accelerators to achieve early cure of the coating shall not be acceptable unless ANSI/NSF Standard 61 certified with the coating system and approved by the Engineer.
 - 9. Keep paint materials sealed when not in use.

3.12 APPLICATION OF PAINT

- A. General:
 - 1. Apply coatings in accordance with the paint manufacturer's recommendations. Allow sufficient time between coats to assure thorough drying of previously applied paint based on prevailing temperatures at the

time of application.

2. Coordinate interior and exterior surface preparation and coating application to not impact or damage work that has been completed.
3. Plan coating application to ensure that specified temperature, humidity, and condensation conditions are met. If conditions do not allow for orderly application of sealant, primer, stripe coat, intermediate coat and topcoat, use appropriate means of controlling air and surface temperatures, as required. Partial or total enclosures, insulation, heating or cooling, or other appropriate measures may be required to control conditions to allow for orderly application of all required coats.

B. Stripe Coat:

1. Brush a stripe coat of coating on all bolted connections, bolt heads and nuts, corners, edges, angles, welds, member intersections, structural steel flanges, crevices, heavily pitted areas, top face of lower rafter flange, and all other deviations from smooth surfaces where paint application may not result in adequate paint thickness and coverage.
2. Stripe coat shall be worked into all cracks, crevices, and seams.
3. Mini-rollers or other tools may be required.
4. Apply stripe coat between primer and intermediate coats.
5. Alternate colors in a multiple coat system to provide a visual reference that the required number of coats has been applied. Stripe coats shall be alternated in color similar to a full coat.

C. Film Thickness:

1. Coverage is listed as either total minimum dry film thickness in mils (MDFT) or the spreading rate in square feet per gallon (SFPG). Per coat determinations are listed as MDFTPC or SFPGPC.
2. Coating film thickness per coat shall be applied at the specified minimum coating thickness or the manufacturer's recommended minimum thickness, whichever is greater. Where the manufacturer has not specified a minimum coating thickness on the product data sheets, the minimum recommended coating application thickness shall apply.
3. Coating shall not exceed the manufacturer's recommended maximum coating thickness nor shall the coating thickness exceed the maximum coating thickness allowed under the NSF certification for the applied coating system, whichever is less. Where no maximum recommended coating thickness is provided or required under the NSF certification, the maximum coating thickness shall not exceed 100 percent of the specified minimum coating thickness, excluding stripe coat.
4. Number of coats: Minimum required irrespective of the coating thickness. Additional coats may be required to obtain the minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.
5. Maximum film build per coat shall not exceed the coating manufacturer's recommendations.

6. Film thickness measurements and electrical inspection of the coated surfaces:
 - a. Perform measurements with properly calibrated instruments.
 - b. Recoat and repair as necessary for compliance with the Specifications.
 - c. All coats will be subject to inspection by the Engineer and the coating manufacturer's representative.
 - d. Give particular attention to edges, angles, flanges, and similar areas to ensure proper paint thickness in these areas.

D. Procedure for Holidays and Spot Repairs of Newly Applied Coating:

1. Repair coating film defects at the earliest practical time and before application of succeeding coat.
2. Prepare the surface as specified for the Coating System under Protective Coating Systems.
3. Feather coating as required to leave 4 inches of each succeeding coat feathered and abraded.
4. Protect adjacent areas from damage and overspray.
5. Remove dust and solvent wipe the prepared area plus an additional 4 inches beyond the prepared area with clean denatured alcohol.
6. Apply each coat within recoat window of preceding coat. Within four hours of preparation, apply primer to prepared steel and feather onto prepared primer.
7. Apply intermediate coat to primed area and feather to prepared intermediate area.
8. Apply topcoat to intermediate coat and feather to prepared topcoat.
9. Apply each repair coat to approximate thickness of surrounding coating system.
10. If 5 percent or more of the total surface area of the ceiling area requires repair to any coat or coats, including feathered areas, the entire ceiling coating system shall be removed and reapplied.
11. Apply one spot coat of the specified primer to bare areas overlapping the prepared existing coating.
12. Apply one spot coat of the specified finish coat(s).
13. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.

E. Procedure for Damage and Spot Repairs of Previously Applied Coating

1. The exact nature of the existing coatings is not known in all cases; however, the specifications assume they have oxidized sufficiently to prevent lifting or peeling when over coated with paints specified.
2. Check compatibility by application to a small area prior to starting the painting.
3. If lifting or other problems occur, request disposition from the ENGINEER.
4. Apply one spot coat of the specified primer to bare areas overlapping the prepared existing coating.
5. Apply one spot coat of the specified finish coat(s).
6. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.

7. Repairs shall be straight edges and made square.

F. Unsatisfactory Application:

1. If the item has an improper finish color, or insufficient film thickness, clean and topcoat surface with specified paint material to obtain the specified color and minimum coverage. Obtain written surface preparation recommendations from the coating manufacturer for coatings that have exceeded the maximum recoat time.
2. Hand or power sand visible areas of chipped, peeled, or abraded paint and feather all edges in non-immersion services. Follow with primer coat and one or more finish coats in accordance with these specifications. Depending on the extent of repair and its appearance, a finish sanding and topcoat may be required.
3. Coating applications with pinholing, out gassing, over spray, or dry spray shall be recoated by brushing to fill pores in coating followed by spray application or shall be removed to the substrate when directed by the Engineer. Final coating thickness shall not exceed maximum coating system thickness as specified.
4. Evidence of runs, peeling, cracks, blisters, or other visible defects and excessive film thickness shall be cause for coating rejection.
5. Repair defects in coating system per written recommendations of coating manufacturer.
6. Leave all staging up until the Engineer has re-inspected the surface or coating. Replace staging removed prior to approval by Engineer.

G. Coating System Curing

1. For coatings subject to immersion, obtain full cure of the completed system. Consult coatings manufacturer's written instructions for these requirements. Do not immerse coating for any purpose until completion of curing cycle.
2. Cure for epoxy coatings shall be a minimum of 7 days.
3. Force curing shall be in accordance with coating manufacturer's recommendations. Heat shall be provided with indirect fired heaters and shall be performed in a manner that provides uniform heating of the metal surfaces. Cure time will be based on the coldest surface temperature and the average daily surface temperature measured during forced curing.

3.12 SEALANT APPLICATION

- A. Apply sealant in accordance with the sealant manufacturer's written instructions and recommendations.
- B. Sealant shall be applied along crevices and overlaps of the plates as specified under PROTECTIVE COATING SYSTEMS after the prime and stripe coats have been applied.
- C. Sealant shall fill the crevice, tool to a concave surface.

- D. Apply remaining coats after sealant has properly cured as recommended by the sealant and coating manufacturers.

3.13 PROTECTIVE COATING SYSTEMS

- A. Unless otherwise shown or specified in these specifications paint or coat the work in accordance with the following coating systems and application schedule.

System No.	Title
1	SUBMERGED METAL REPAIR - POTABLE WATER (POLYAMIDE EPOXY)
6	EXPOSED METAL - ATMOSPHERIC, REPAIR

- B. In the event of discrepancies or omissions in the following, request clarification from the Engineer before starting the work in question.

- C. System No. 1 Submerged Metal Repair - Potable Water (100% Solids Epoxy):

1. Coating system to be applied to interior surfaces of the 1MG 4700 South 6000 West Tank.
2. Surface Preparation and Coating System:

Surface Preparation	Paint Material	Min. Coats, Cover
Abrasive Blast (SP 5) White Metal	Potable Grade, Epoxy Sherwin Williams Macropoxy 646	1 stripe coat, 3 MDFT
	Potable Grade, Epoxy Sherwin Williams Macropoxy 646	3 coats, 4 MDFTPC

- a. Specific requirements for the steel tank includes:
 - (1) Surface preparation by sweep blasting existing coated interior surfaces of the tank, both above and below the water surface, including interior surfaces of new roof vents and extending a minimum of 1-foot inside tank piping, drains, and overflow.
 - (2) Apply sealant to all overlapping members above and below maximum water level, listed below where existing sealant has failed or is damaged from surface preparation of coating:
 - (a) All skip welds inside the tank
 - (b) Around the tank knuckle (shell/roof interface)
 - (c) Around the painter's rail
 - (d) Roof plate overlaps are specifically excluded from sealant application.**
 - (e) Sealant shall be applied after application of the coating.

D. System No. 6 Exposed Metal - Atmospheric, Repair:

1. Coating system to be applied to the exterior roof of the 1MG 4700 South 6000 West.
2. Surface Preparation and Coating System:

Surface Preparation	Paint Material	Min. Coats, Cover
Abrasive Sweep Blast with Abrasive Sized to Achieve Profile, minimize damage to existing coating, and Promote inter-coat adhesion	PPG Aquapon LT 95 Epoxy	1 coat, 4 MDFT
	PPG PSX 700 Polysiloxane	1 coat, 4-6 MDFT

3. Use on the following items or areas:
 - a. Existing polysiloxane finish coats and loose epoxy coating to be removed by abrasive blasting.
 - b. All exterior surfaces of the tank and any surfaces damaged during Work.

3.14 TANK OCCUPANCY AFTER COATING APPLICATION

- A. Use clean canvas, or other approved, shoe covers when walking on coated surfaces, regardless of curing time allowed. For heavily trafficked areas, provide cushioned mats for additional protection.

3.15 PROJECT IDENTIFICATION

- A. At the completion of the tank work, stencil coating information on the exterior of the tank adjacent to the main manway opening. Information should be easily accessible from the ground.
- B. Stenciling shall be in 3-4 inch Helvetica style letters of contrasting color using acrylic stencil paint:
 - Date Interior Coated:
 - Contractor:
 - Surface Preparation:
 - Interior Coating Materials:
 - Exterior Coating Materials:

3.16 SURFACE PREPARATION AND COATING INSPECTION

- A. Contractor's NACE CIP quality control personnel shall perform surface preparation and coating inspections in advance of Engineer inspection. Contractor's quality control

inspection shall be documented on Contractor's daily log forms.

- B. Schedule with Engineer in advance for inspection of cleaned surfaces and all intermediate coats prior to application of succeeding coats.
- C. Contractor shall allow time for inspection of all blasted and coated surfaces by Engineer and CONTRACTOR's quality control representative prior to coating application.
- D. Blasted surfaces not coated following inspection of surface preparation surfaces requiring re-blasting or coating are subject to re-inspection by the Engineer.
- E. Scaffolding or manlift shall be provided and moved by the Contractor to locations requested by the Engineer for facilitate inspection. Illumination shall be provided to cover all areas to be inspected.
- F. Coating Thickness Testing:
 - 1. At a minimum, testing conformance to the requirements of SSPC PA-2, however Engineer shall conduct coating thickness testing as necessary and without limitation.
 - 2. Measure coating thickness specified in mils with a magnetic or electronic type dry film thickness gauge as specified.
 - 3. Check each coat for the correct coating thickness. Do not make measurement within 8 hours after application of the coating or before coating recoat time for the temperatures at the time of application, whichever is greater.
 - 4. Final dry film thickness measurements will be taken after repaired and recoated areas have dried a minimum of 24 hours or have dried to a hard finish, whichever is greater.
 - 5. Coating thickness greater than recommended by coating manufacturer or greater than NSF certification documentation shall result in removal of excess coating per coating manufacturer's recommendations.
- G. Coating Holiday Testing:
 - 1. Option 1:
 - a. Check coatings for film characteristics or defects that would adversely affect performance of coating systems.
 - b. Check exterior finish for film characteristics or defects that adversely affect appearance.
 - c. Check for holidays on steel immersion surfaces using a holiday detector in accordance with NACE SP0188-06 or with safe blue light inspection lamps if B62VX265 hardener with Opti-Check OAP pigment technology is used.
 - 2. Option 2:
 - a. Contractor shall perform holiday testing on all interior reservoir surfaces and make necessary repairs in the presence of the Engineer. Holiday testing will be performed on 100 percent of finished interior shell and floor coating, and all roof rafters, girders, connections, and

- roof plates, except at plate overlaps and top of rafters.
- b. Holiday testing will be performed at the Engineer's discretion on exterior surfaces of the reservoir.
 - c. For coating systems with dry film thickness of 20 mils or less, Holiday testing shall be performed in accordance with NACE Recommended Practice RP0188. Testing shall be conducted using either high voltage spark testing or wet sponge testing. High voltage spark testing shall be conducted using an Elcometer 136 or equivalent variable voltage equipment. When using wet sponge holiday test, tests shall be conducted with a non-sudsing type wetting agent, such as Kodak Photo-FLO, added to the water.
 - d. For coating systems with dry film thickness greater than 20 mils, test for holidays and coating discontinuities with a high voltage holiday detector in accordance with NACE Recommended Practice RP0188.
 - e. The Contractor will retest areas repaired.

3.17 CLEANUP AND DISINFECTION

A. General:

1. Place cloths and waste that might constitute a fire hazard in closed metal containers or destroyed at the end of each day.
2. Upon completion of the work, remove staging, scaffolding, and containers from the site or destroyed in a legal manner.
3. Completely remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.
4. Damages due to over spray on buildings, vehicles, trees, or other surfaces not specified to be painted would be the responsibility of the CONTRACTOR.
5. Contractor shall perform final cleanup of the interior of reservoir. Final cleaning will include a broom sweep of the floor to remove all foreign objects and a high-pressure wash of walls, ceiling, and supporting structures to dislodge any fine grit, dust, or foreign materials. The floor shall be high pressure washed and brushed clean to remove any material that may be bonding to the floor. The water may be disposed down the tank drain. The Owner shall provide the water necessary for cleaning and approve final cleaning. No residual dirt dust or staining will be permitted on the finished coating surface.
6. The Owner shall be responsible for disinfecting of the tank and final securing of manways.

B. Lead Paint Debris Cleanup and Storage:

1. All visible paint dust or debris on the reservoir or ground shall be cleaned up by vacuuming at the end of each day.
2. All spent abrasive and paint debris shall be stored on site as hazardous waste in approved containers until Contractor's laboratory testing has confirmed the nature of the waste.

3. Clothing, tack clothes, and other reusable items that become contaminated with lead paint debris shall be stored in a covered enclosure on the project site. The Contractor shall be responsible for laundering the items at an approved facility at his sole expense.
4. No waste shall be permitted to leave the site until all required and specified laboratory analysis of waste has been completed, the Owner receives notification and approves transportation of the waste to the appropriate, designated disposal facility.
5. Non-hazardous waste, refuse, and debris shall be stored in separate containers away from the hazardous waste storage area.
6. Contractor shall dispose of all hazardous and non-hazardous waste generated from the Work in accordance with State and Federal regulations, at the Contractor's sole expense.

3.18 MANUFACTURER' SERVICES

- A. Furnish paint manufacturer's representative to visit jobsite at intervals during surface preparation and painting as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions and these specifications, and as may be necessary to resolve field problems attributable to, or associated with, manufacturer's products furnished under this Contract.

3.19 TWO YEAR WARRANTY INSPECTION

- A. The Contractor guarantees the work and materials furnished for two years after Substantial Completion is issued by the Owner to the Contractor. The Contractor's guarantee includes that materials furnished or any work performed shall be the best of its class and that work and materials fully meet the requirements of this Specification. Remedial work required shall be performed and guaranteed as stated in this Section.
- B. Coatings identified as repairs on the interior of the 1MG Tank at 4700 South 6000 West and the exterior roof at the 1MG Tank at 9400 South 2800 East that do not include full removal of previously applied coating shall be warranted for two years, only for the Work completed by the Contractor under this Contract.
- C. The Contractor may, at his option, be present during the two-year warranty inspection. The interior and exterior surfaces of the tank shall be inspected by Owner representatives and the Contractor at approximately two years after the coating work has been completed to determine whether any repair work is necessary.
- D. The Owner shall establish a date for inspection and shall notify the contractor at least 30 days in advance.
- E. The Owner shall partially or fully drain the tank and provide safety equipment, suitable interior lighting and ventilation for the tank inspection.

- F. Locations where coating has peeled, bubbled, or cracked or where corrosion is evident shall be considered as failure of the coating system. The Contractor shall make repairs at all points where failures are observed by removing the deteriorated coating, cleaning the surface, and recoating with the same coating system. If the area of failures exceeds 25% of the area of a portion of the tank surface, then for that portion, the entire coating system shall be removed and recoated. For the purposes of determining the need for complete recoating, the interior ceiling, shell, and floor and the exterior roof and shell shall each be considered separately. The Owner may, at any point during or after the work under this Specification, use destructive test instruments to analyze coating failures observed. The Owner will establish a starting date and a reasonable time of completion for remedial work.

- G. All remedial work performed shall be guaranteed for two years from completion for defects of materials and workmanship.

(See PSDS form following this section)

END OF SECTION

PAINT SYSTEM DATA SHEET

Attached products' Technical Data Sheet (if applicable) to this sheet for each paint system submittal.

Paint System Number (from spec.):		
Paint System Title (from spec.):		
Coatings Manufacturer:		
Representative:		
Surface Preparation:		
Paint Material (Generic)	Product Name/Number (Proprietary)	Min. Coats, Coverage

Ambient Temperature Application Limitations: min.: max.:

Substrate Surface Temperature Application Limitations: min.: max.:

Surface Profile Requirements: min.: max.:

Additional Information Required:

1. ANSI/NSF Certification letter for each paint material listed above requiring ANSI/NSF Standard 61 approval. Include maximum allowable total dry film coating thickness for ANSI/NSF Standard 61 certification.

2. Manufacturer's minimum and maximum recommended coating thickness per coat and for total coating system.

3. Minimum and maximum allowable recoat window time and temperature data at 10 degree increments from 40 to 130 degrees.

4. Immersion coating cure requirements for potable water applications from minimum coating application temperature to 120 degrees in 10-degree temperature increments.