

## **ADDENDUM NO. 2**

### **VILLAGE OF NEW MADISON 150,000 Gallon Elevated Water Storage Tank November 30, 2018**

To: Planholders

From: Mote & Associates, Inc. Phone: (937) 548-7511  
214 West Fourth Street Fax: (937) 548-7484  
Greenville, Ohio 45331 E-mail: info@moteassociates.com

Re: Village of New Madison  
150,000 Gallon Elevated Water Storage Tank

This Addendum forms a part of the Contract Documents and modifies the original Contract Documents dated November 2018 and Addendum No. 1 dated November 26, 2018. Acknowledge receipt of this Addendum in the space provided on the Bid Proposal form. Failure to do so may subject the Bidder to disqualification.

#### **CHANGES/CLARIFICATIONS TO THE BIDDING REQUIREMENTS:**

1. Section 00 41 43, Bid Form

The Bid Form has been replaced to reflect the addition of two Alternates that will apply to both tank options. The Alternates are as follows:

Alternate #1: Replacement of the “standard” urethane paint for the “NEW MADISON” logo to be placed on both sides of the tank to a fluorourethane type paint provided by one of the manufacturer’s as listed in the Coatings & Linings of Elevated Water Storage Tanks, Section 09 07 13 technical specification.

Alternate #2: Item a: Replace the logo on one side of the tank from “NEW MADISON” to read “HOME OF THE PATRIOTS” with a Patriot Logo similar to the attached example.

Item b: Replacement of the “standard” urethane paint for the “HOME OF THE PATRIOTS” logo to be placed on one side of the tank to a fluorourethane type paint provided by one of the manufacturer’s as listed in the Coatings & Linings of Elevated Water Storage Tanks, Section 09 07 13 technical specification.

The Revised Bid Form attached hereto and shall be utilized with the proposal forms submitted for a responsive bid to reflect this addition of these bid alternates.

2. Section 01 33 10, Submittal Checklist:

The submittal requirements for Specification 09 07 13, Coatings & Linings of Elevated Water Storage Tanks has been revised to exclude item F and is attached hereto.

## CHANGES/CLARIFICATIONS TO THE TECHNICAL SPECIFICATIONS

### 3. Section 09 97 13, Coatings & Linings Of Elevated Water Storage Tanks

This technical specification has been revised and the replacement is attached hereto and shall be utilized for this project in lieu of the version included in the Contract Documents Manual.

Changes include the following: 1) Removal of containment requirements; 2) Revision to Section 3.02, Safety and Regulatory Compliance – omitted soil sample requirements; 3) Revisions to allow abrasive blasted surfaces to be cleaned by blown down air or vacuum cleaning, but not both; 4) Removal of any references to spray paint application since this method shall not be used; and 5) Revision to Section 3.09, A., 4 regarding unprimed margins of shop primed steel plates shall be prepared in accordance with the surface preparation requirements of the balance of the steel plate surfaces.

### 4. Section 33 16 13.14, Steel Aboveground Water Utility Storage Tanks – Ellipsoidal and Section 33 16 13.16, Steel Aboveground Water Utility Storage Tanks – Pedestal

The inlet pipe in the dry riser is to be insulated to protect against -35 degree weather with 4” of insulation and an aluminum jacket.

Also, please note that these technical specification sections require all Bidders to provide a “sketch of the tank” being proposed for either or both Options to be submitted as part of the Bid package and include the appropriate dimensions.

## CHANGES/CLARIFICATIONS TO THE CONSTRUCTION PLANS

### 5. Sheet 4, Note 16

Electric power is available at the existing service of the Village’s community well located near the site of the water tower. Outdoor receptacles will be available for use by the Tower Contractor for the completion of the work.

## GENERAL CLARIFICATIONS

- Two construction access locations will be available for the construction site as shown on the attached Exhibit A – Map of Construction Access Point Locations. Upon award of the Contract, the Village will work with the Tower Contractor to provide access based on the type of equipment, trucks, etc. that will need to gain access. Any additional site work necessary to utilize either of these locations will be the responsibility of the Village (Owner).

End of Addendum

Attachments: Section 00 41 43, Revised Bid Form  
“Home of the Patriots” Logo Example  
Section 01 33 10, Submittal Checklist  
Section 09 97 13, Coatings & Linings of Elevated Water Storage Tanks  
Exhibit A - Map of Construction Access Point Locations

**REVISED BID FORM**

**00 41 43**

**ARTICLE 1 - BID RECIPIENT**

1.01 This Bid is submitted to:

**[Village of New Madison, 124 Harrison Street, PO Box 15, New Madison, OH 45346]**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

**ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS**

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

**ARTICLE 3 - BIDDER'S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

| <u>Addendum No.</u> | <u>Addendum, Date</u> |
|---------------------|-----------------------|
| _____               | _____                 |
| _____               | _____                 |
| _____               | _____                 |

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and

documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- K. Bidder agrees that the contracting authority reserves the right to reject any or all bids, to waive any informalities or irregularities in the bids received, and to accept that bid which is considered lowest and to the best interest of the Owner.

#### **ARTICLE 4 - BIDDER'S CERTIFICATION**

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. No person interested in this Proposal is directly or indirectly interested in or connected with any other bid or proposal for the said work and no member of the Village of New Madison, Ohio, is directly or indirectly interested therein, or in any portion thereof, and he will, if required by the Village of New Madison, Ohio, execute and submit from himself as Principal Contractor and from any Subcontractor, the non-collusion affidavits as provided herein.
- D. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- E. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

**ARTICLE 5 - BASIS OF BID**

- 5.01 Bidder agrees that any item not specifically shown or called out on the plans or within the specifications, but is required to complete the work in place and fully operational, shall be included in the bid item that is most closely associated with that portion of the work.
- 5.02 Bidder will complete the Work in accordance with the Contract Documents for the following price(s) and will contract to do all the work and furnish all the materials called for by said plans and specifications, and in consideration thereof, to accept from the Owner as full payment for the completion of each specified item and any required maintenance thereof as hereinafter provided, for the following prices;

**BID OPTION A – ELLIPSOIDAL  
150,000 GALLON ELEVATED WATER STORAGE TANK**

| Ref No. | Description  | Unit   | Cost |
|---------|--|--------|------|
| 1       | 150,000 Gallon Elevated Water Storage Tank (Ellipsoidal) | 1 L.S. |      |
| 2       | Coatings and Linings                                     | 1 L.S. |      |
| 3       | Tank Lettering – "New Madison"                           | 1 L.S. |      |
| 4       | Electrical, Lighting, and Grounding                      | 1 L.S. |      |
| 5       | Site Restoration and Seeding                             | 1 L.S. |      |
| 6       | Dewatering   | 1 L.S. |      |
| 7       | Mobilization, Bonding, and Insurance                     | 1 L.S. |      |

**Total Bid Option A:**

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(in words)

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**BID OPTION B – SPHEROIDAL (PEDESTAL)  
150,000 GALLON ELEVATED WATER STORAGE TANK**

| <u>Ref No.</u> | <u>Description</u>                                      | <u>Unit</u> | <u>Cost</u> |
|----------------|---|-------------|-------------|
| 1              | 150,000 Gallon Elevated Water Storage Tank (Spheroidal) | 1 L.S.      |             |
| 2              | Coatings and Linings                                    | 1 L.S.      |             |
| 3              | Tank Lettering – “New Madison”                          | 1 L.S.      |             |
| 4              | Electrical, Lighting, and Grounding                     | 1 L.S.      |             |
| 5              | Site Restoration and Seeding                            | 1 L.S.      |             |
| 6              | Dewatering  | 1 L.S.      |             |
| 7              | Mobilization, Bonding, and Insurance                    | 1 L.S.      |             |

**Total Bid Option B:**

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(in words)

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**ALTERNATE BID #1**

| <u>Description</u>  | <u>Unit</u> | <u>Cost</u> |
|---|-------------|-------------|
| Replace use of standard urethane paint with fluorourethane paint for “New Madison” lettering (two sides of tank). | Lump        |             |

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**ALTERNATE BID #2**

| <u>Description</u>  | <u>Unit</u> | <u>Cost</u> |
|---|-------------|-------------|
| A. Provide stencil and painting for "Home of the Patriots" lettering and logo on one side of the tank in lieu of "New Madison" lettering using standard urethane paint as per the Logo Example. ("New Madison" lettering will remain on opposite side of the tank. This cost should also reflect any deduction for the removal of the "NEW MADISON" lettering on one side of the tank.) | Lump        |             |
| B. Replace use of standard urethane paint with fluorourethane paint for "Home of the Patriots" lettering and logo as per the Logo Example.  | Lump        |             |

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- 5.03 Bidder acknowledges that: If this Proposal shall be accepted, Bidder will be prepared to discuss with the Village of New Madison, Ohio, in detail any matters relating to special features and the methods proposed to be followed for the general conduct of the work, that within ten (10) days after "Notice of Award" the Contract Form with the Village of New Madison, Ohio, for performance of the work will be completed and Bidder will furnish a Contract Bond or a Performance and Payment Bond in an amount not less than one hundred percent (100%) of the total bid amount, and with sureties subject to the approval of the Village of New Madison, Ohio, as a guarantee of the faithful performance of this Contract; and that Bidder will also submit the required insurance policies.

**ARTICLE 6 - TIME OF COMPLETION**

- 6.01 Bidder agrees that the Work will be substantially complete and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **November 30, 2019.**
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the amount of \$1,000.00 for every consecutive day after the stated date in the Notice to Proceed and along with any time extension given per a Change Order and it may be retained from the monies which may be due.

**ARTICLE 7 - ATTACHMENTS TO THIS BID**

- 7.01 The following documents are submitted with and made a condition of this Bid:
- A. Required bid security;
  - B. Affidavit for Corporation;
  - C. Required Bidder Qualification Statement with supporting data;
  - D. List of Proposed Subcontractors;
  - E. Non-Collusion Affidavit;
  - F. Certifications as listed in Section 3—Procurement Forms & Supplements in the Table of Contents;
  - G. Sketch of tank with dimensions.

**ARTICLE 8 - DEFINED TERMS**

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

**ARTICLE 9 - BID SUBMITTAL**

BIDDER: *[Indicate correct name of bidding entity]*

By: \_\_\_\_\_

*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_

*(If Bidder is a corporation, limited liability company, partnership or joint venture, attach evidence of authority to sign.)*

Address for giving notices:

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Bidder's Federal ID No.: \_\_\_\_\_

Contact Name and e-mail address: \_\_\_\_\_



**HOME OF THE**



**PATRIOTS**

**SUBMITTAL CHECKLIST**

01 33 10

Project: 150,000 Gallon Elevated Water Storage Tank  
 Owner: Village of New Madison, Ohio

Additional Action Requested:

- |                            |                                    |
|----------------------------|------------------------------------|
| A. Product Data            | G. Installation Instructions       |
| B. Performance Data        | H. Test Report                     |
| C. Schematic Drawings      | I. Record Documents                |
| D. Shop Drawings           | J. Operation & Maintenance Manuals |
| E. Device Schedule         | K. Work Schedule                   |
| F. Qualification Statement |                                    |

| Specification Reference | Description of Item to be Submitted | Additional Action Required | Date Received | Date Reviewed |
|-------------------------|-------------------------------------|----------------------------|---------------|---------------|
| 01 78 39                | Project Record Documents            | I                          |               |               |
| ODOT 499                | Concrete - General                  | A, B, D, K                 |               |               |
| ODOT 509                | Reinforcing Steel                   | A, B, D                    |               |               |
| 09 07 13                | Coatings and Linings of Elev. Tank  | A, B, D, F, K              |               |               |
| 26 00 00                | Electrical                          | A,B, D, F, G, J, K         |               |               |
| 33 11 13                | Water Line and Fittings             | A, B, D, G, K              |               |               |
| 33 12 16                | Water Valves                        | A, B, D, G                 |               |               |
| 33 12 19                | Fire Hydrants                       | A, B, D, G                 |               |               |
| 33 16 13.14             | Steel Elev. Tank - Ellipsoidal      | A, B, D, F, G, J, K        |               |               |
| 33 16 13.16             | Steel Elev. Tank - Pedestal         | A, B, D, F, G, J, K        |               |               |
|                         |                                     |                            |               |               |
|                         |                                     |                            |               |               |
|                         |                                     |                            |               |               |
|                         |                                     |                            |               |               |
|                         |                                     |                            |               |               |
|                         |                                     |                            |               |               |
|                         |                                     |                            |               |               |

Additional submittal requests: \_\_\_\_\_

Additional submittal requests: \_\_\_\_\_

# COATINGS AND LININGS OF ELEVATED WATER UTILITY STORAGE TANKS

09 97 13

## PART ONE – GENERAL

### 1.01 Scope of Work

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required for the coating, lining, and finishing of all surfaces so designated.

### 1.02 Applicable Standards

The following specifications shall govern with modifications as specified herein:

- A. OSHA Safety Standards for the Construction Industry, Title 29 - Labor, Subtitle B - Regulations Relating to Labor, Occupational Safety and Health Administration (OSHA) 1926, 07/01/93 editions.
- B. OSHA Worker Safety, Hazard Communications as described by the Occupational Safety and Health Act Regulation 29 CFR No. Parts 1900 through 1910.1499, 07/01/93 editions.
- C. SSPC Volume 1, *Good Painting Practice*, Latest Edition.
- D. SSPC Volume 2, Systems and Specifications, Latest Edition, *Surface Preparation Guide and Paint Application Specifications of the Steel Structures Painting Council*.
- E. NACE International, National Association of Corrosion Engineers.
- F. NACE - Coatings and Lining Handbook, National Association of Corrosion Engineers.
- G. SSPC and NACE Painter Safety Guidelines, latest editions.
- H. AWWA D-102, latest revision: *Coating Steel Water Storage Tanks* – Coatings for immersion service shall meet the application and product requirements by the Ohio E.P.A. and Standard Number 61 of the National Sanitation Foundation.
- I. AWWA D-100, latest revision: *Welded Carbon Steel Tanks for Water Storage*

### 1.03 Regulatory Agencies Requirements

- A. Clean Air Act (CAA) - Hazardous Air Emissions by U.S. EPA or State Agency under Regulation 40 CFR 61 or state equivalent.

- B. Clean Water Act (CWA) - Hazardous Water Releases by U.S. EPA or State Agency under Regulation 40 CFR 116 through 117 or state equivalent.
- C. Toxic Substances Control Act (TSCA) - Toxic substance by U.S. EPA under Regulation 40 CFR 761.
- D. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "SuperFund") - Uncontrolled Hazardous Waste Sites and Hazardous Substance Release by U.S.EPA under Regulation 40 CFR 302.
- E. Resource Conservation and Recovery Act (RCRA) - Generation, Transportation, Treatment, Storage and Disposal of Hazardous Waste by U.S.EPA or State Agency under Regulation 40 CFR 260 through 267 or state equivalent.
- F. Hazardous and Solid Waste Amendments (HSWA) - Further regulation of hazardous waste by U.S.EPA or State Agency under Regulation 40 CFR 260 through 267 or state equivalent.
- G. Hazardous Material Transportation Act (HMTA) - Transportation of Hazardous Material by DOT or State Agency under Regulation 49 CFR 171 through 179 or state equivalent.
- H. Continuous ventilation shall be provided during application and cure so that coatings for surfaces in contact with potable water or water being treated for potable use shall not impart any taste or odor to the water or result in any organic or inorganic content in excess of the maximum contaminant level established by applicable laws or regulations. Revise painting system specified herein to provide manufacturer's regulatory agency approved coating system where required.
- I. All coatings used on surfaces in contact with potable water shall comply with Ohio EPA Drinking Water Standards and be listed in the latest version of the publication by National Sanitation Foundation (NSF) listing Paints and Coatings Approved for Use In Potable Water and be NSF and UL approved.

#### 1.04 Definitions

*Abrasive:* Material used for blast-cleaning, such as slag, grit, or aluminum oxide.

*Anchor Pattern:* Profile or texture of surface, as a result of abrasive blasting. Also referred to as anchor profile or blast profile.

*ASTM:* American Society for Testing Material.

*AWWA:* American Water Works Association.

*Barrier Coating:* Protective film isolating substrate or previous coat from environment.

*Binder:* Resin; polymer; film forming portion of paint.

*Blast Cleaning:* Cleaning by abrasive propelled at high speed.

*Coatings and Linings:* The term "coatings and/or linings" as used herein means all protective coating systems and materials, which include surface preparations and all pretreatment, primers, inorganic zinc, organic zinc, epoxies, polyurethanes, epoxy phenolic, acrylics, phenolics, elastomeric polyurethane and other applied materials whether used as prime, base, seal, mist, intermediate, or finish coats. Linings are for interior wet area and immersion duty and coatings are for atmospheric exposure.

*Coating Manufacturer:* The manufacturer and source of the coatings and linings products furnished for this Contract.

*Coating Superintendent:* That employee of the coating and lining Contractor who is designated by the coating and lining Contractor as the supervisor of all coating and lining work and as the official representative of the coating and lining Contractor at any project meetings or discussions.

*Coating Supplier:* The coating and/or lining manufacturer's agent or technical representatives who is supplying the materials directly to the Contractor.

*Coating System:* The combination of surface preparation, base (prime) coat, intermediate coat(s) and finish coat(s) for a specific substrate under specific exposure conditions.

*Curing:* The process of polymerization or hardening of a coating or lining as it goes from a liquid to a solid. Determination of completion of curing shall be in accordance with manufacturers guidelines.

*Delaminating:* Separation and peeling of one or more coats from an undercoat.

*Dew point:* Temperature of a given air/water vapor mixture at which moisture condensation starts.

*Drips (also called spotting):* Paint that falls in drops causing either an uneven surface or visible drop.

*Dry Film Thickness (DFT):* Depth of cured film, usually expressed in mils (0.001 inch).

*Drying Time:* Time interval between application and curing of material.

*Dry to Recoat:* Time interval between application of material and ability to receive next coat, may not be fully cured.

*Dry to Touch:* Time interval between application of material and ability to touch lightly without damage, is not fully cured.

*Dry Spray:* Over spray or bounce back; sandy or textured finish due to spray particle being partially dried before reaching the surface. Dry spray is considered to be a coating defect.

*Fading:* Reduction in brightness of color, particularly from long term sun exposure.

*Festoons:* A string or garland appearance in the coating, suspended in a loop or curve between two points.

*Finish Coat:* Final coating or lining applied after intermediate coat(s).

*Fish Eye:* Pigment separation, or pulling apart of paint film to form holes.

*Floating:* Separation of paint pigment to surface of wet paint.

*Full Wet Coat:* A heavy, glossy coat that is applied in a thickness almost heavy enough to run or sag. Provides maximum possible thickness.

*Galvanized Steel:* Zinc-coated steel, usually from dipping in bath of molten zinc.

*Gloss:* Luster; sheen; brightness.

*Grit:* Abrasive from slag and other sources used in blast cleaning.

*Hardener:* Catalyst; curing agent.

*Holiday:* Coating or lining defect such as a pinhole, void, skip, or other discontinuity in the coating film.

*Incompatibility:* Inability of a coating to perform well over another or substrate coating because of bleeding, poor bonding, or lifting of old coating; or inability of a coating to perform well on a substrate.

*Induction Time:* Time interval between mixing of components and chemical cross linking for satisfactory application of multi-component coatings and linings. Also referred to as "sweat in" time.

*Inorganic Coating:* Coating with inorganic binder (e.g., silicate or phosphate) rather than organic (e.g., of petroleum, animal, or plant origin). Commonly inorganic zinc (IOZ).

*Intermediate Coat(s):* Coat(s) applied after prime or base coat and prior to finish coat(s).

*Laitance:* White or gray weakened material floated to the surface of new concrete. This layer is not dense sound concrete and requires removal prior to application of high performance coatings and linings.

*Lifting:* Softening and raising of an undercoat by solvent in applied topcoat.

*Livered:* The progressive, irreversible increase in consistency of a pigment-vehicle combination. Livering in the majority of cases arises from a chemical reaction to the vehicle with the solid dispersed materials, but it may also result from polymerization of the vehicle. The irreversible character of the changes in the livered material distinguishes it from thixotropic "build-up", which is reversible.

*Mil:* 0.001 inch.

*Mill Scale:* The heavy oxide layer formed during hot fabrication or heat treatment of metals. Cathodic to its steel substrate.

*Mist Coat:* A partially complete coat applied with a more rapid gun motion than a full wet coat. The mist coat should displace the air in porous coatings such as inorganic zinc primer.

*NACE International:* National Association of Corrosion Engineers.

*Near White Blast:* A grade of abrasive blast cleaning of steel, equal to NACE No. 2 or SSPC-SP10.

*NSF:* National Sanitation Foundation.

*NWS:* National Welding Society.

*Orange Peel:* Hills and valleys in paint resembling the skin of an orange.

*Over spray:* Dry spray, particularly such paint that failed to strike the intended surface.

*Peeling:* Paint curling or stripping from substrate.

*Pigment:* Solid, opaque, frequently colored component of paint.

*Pinhole:* Film defect characterized by small pore-like flaws in a coating which extends entirely through the applied film and have the general appearance of pin pricks when viewed by reflecting light. The term is rather generally applied to holes caused by solvent bubbling, moisture, other volatile products, or the presence of extraneous particles in the applied film.

*Pot Life:* Time interval after mixing of components during which the coating can be satisfactorily applied.

*Primer or Prime Coat:* First coat applied to a substrate usually containing inhibitive pigments when formulated for metals.

*Profile:* Surface texture, particularly of abrasive blast cleaned steel.

*Ropiness:* Forming sticky glutinous strings or threads resembling ropes.

*Run*: Sag; curtain; associated with too heavy of a wet application of a paint film.

*Sag*: Run; curtain.

*Seal Coat*: Coat applied to a prime coat for the purpose of sealing to prevent adverse affects of gasification.

*Shelf Life*: Maximum storage time for which a material may be stored without losing its usefulness.

*Shop Coat*: Coat of paint applied in fabricating shop.

*Spreading Rate*: Area covered by a unit volume of paint at a specific thickness.

*SSPC*: The Society for Protective Coatings.

*Tack Coat*: A light covering coat applied to the surface and then allowed to flash off until it is just tacky usually taking a matter of minutes. The full wet coat is then applied which provides for thicker film build.

*Thinner*: Reducer; solvent added to reduce paint viscosity for easier application.

*Thorough Drying*: Curing of paint film through entire thickness as opposed to drying only on the surface.

*Tiecoat*: Thin adhesive coat applied to a cured paint to enhance the bonding of a topcoat.

*TCLP*: Toxicity Characteristic Leaching Procedure. A standard test used to determine if a solid waste is considered a hazardous waste by virtue of its toxicity. It is intended to simulate the leaching of toxic constituents that would take place in a landfill.

*TPC*: Technical Practices Committee of NACE.

*TSR*: Technical Service Representative.

*UL*: Underwriters Laboratory.

*Vehicle*: Liquid portion of coating materials; resin and solvent components of the coating.

*Weld Spatter*: Beads of metal scattered near seam during welding.

*White Metal Abrasive Blast*: Highest level of abrasive blast cleaning of steel, NACE No. 1 or SSPC-SP5.

## 1.05 Project Requirements



- A. The work shall be planned and scheduled so as to not damage the properties or structures or interfere with normal activities and vehicle traffic in the area of the tank. Provisions shall be made so as to not allow over spray, roller splatter or spent abrasive or debris from surface preparation to drift out of the immediate tank area to land on any nearby property or vehicles. It is recommended that the Contractor perform a site investigation prior to submitting their bid. Any cost due to property damage as a result of the construction of the water tower will be the responsibility of the Contractor regardless of the type of containment used.
- B. Containment: Due to the isolated proximity of the proposed tower, containment should not be needed to protect any and all adjacent property. Note that if vacuum blasting is used, full enclosure is not needed for the blasting operation.
- C. Primer Coat: All prime coats on the proposed tower shall be shop applied except for the wet interior which must be field applied. All remaining coats shall be field applied. A “holding shop primer” shall be applied to the wet interior to help protect from rust bleeding.
- D. Lettering: NEW MADISON, in block letters, shall be printed on two sides of the tank. All painting shall be of a size both in height and width, style and spacing as approved by the Owner and Engineer. The cost for preparing lettering templates, etc. shall be included in the cost for the painting. The Contractor shall recommend placement of overflow, ladder, and any other obstructions so they do not interfere with the lettering.

Paint lettering and signs shall be compatible, but of a different color than the exterior. It shall be placed prior to the application of the top coat.
- E. Permits: Contractor shall procure any work permits, etc. as required by the U.S. Government, the State of Ohio or local regulations or ordinances.

#### 1.06 Quality Assurance

- A. Coating Contractor Qualifications:
  - 1. Contractor shall be regularly engaged in work requiring extensive surface preparation in accordance with AWWA, Ohio EPA, NSF, UL, SSPC and NACE standards.
  - 2. Contractor shall have a minimum of five years experience in the mixing and application of high performance industrial coatings and linings.
  - 3. Contractor shall submit a list of at least five (5) municipal utilities or industrial installations completed, responsible officials, engineers, architects, coating consultants or specifiers involved with the project and the approximate contract price.
  - 4. A Contractor not meeting these requirements is required to obtain a Technical Service Representative (TSR) for the duration of the application period.

B. Manufacturer Qualifications: Provide products manufactured as outlined by one or more of the following:

1. Acceptable Coating/Lining Manufacturers:

- a. Carboline
- b. Sherwin Williams
- c. Tnemec
- d. Or approved equal

2. Source Quality Control: Obtain coating and lining materials only from manufacturers who can provide the services of a qualified Coating Manufacturer's Technical Service Representative (TSR) at the project site for participation in the preconstruction meeting, at the commencement of the Application Phase of the Work, and other times as required. If the Coating Contractor can satisfy the qualifications listed in section 1.06.A, they can provide the services outlined for the TSR. TSR shall be qualified as follows:

- a. The Coating Manufacturer's Technical Service Representative shall have five (5) years of high performance coating and lining experience.
- b. The Coating Manufacturer's Technical Service Representative shall be experienced in the coating system and surface preparation required by these specifications. The Contractor shall submit evidence of experience through the submittal process.
- c. The Coating Manufacturer's Technical Service Representative shall be thoroughly familiar with requirements of the NACE International Coating Inspector Training and Certification Program (NICITCP).

#### 1.07 Submittals

A. Shop Drawings: Comply with Section 01 33 10, Submittal Checklist.

At the Pre-Construction Conference submit the following:

1. Work Plan indicating methods of construction, staging details, site arrangement, traffic patterns, warning sign locations, etc.
2. Preliminary Schedule.
3. Lead Compliance Plan.

B. Provide Contractor/Manufacturer Qualifications:

1. Coating Contractor Qualifications, See Section 1.06 A.
2. Manufacturer/TSR Qualifications, See Section 1.06 B.

- C. Provide Shop Drawings for the following:
1. Critical Path Schedule: Step by step procedures that will be followed to complete each segment of the specified work. The critical path shall allow for the necessary hold points and inspections.
  2. Product Data: Coating and lining manufacturer's product data sheets, coating container labels, material analysis, detailed surface preparation guidelines, surface preparation requirements, detailed application instructions for each material proposed for use. Manufacturer's requirements exceeding these specifications shall prevail. Additional specific coating/lining information shall be required as follows:
    - a. Induction time at all acceptable temperatures and relative humidity.
    - b. Pot life at all acceptable temperatures and humidity ranges.
    - c. Manufacturer's recommended thinners with detailed mixing, storage and application procedures and required application equipment. Maximum allowable thinning that complies with Clean Air Act, Volatile Organic Compounds (VOC) limits.
    - d. Manufacturer's Material Safety Data Sheets for each product.
  3. Color Charts
    - a. Actual color draw-down samples.
- D. Operation and Maintenance Data:
1. Include a copy of all approved shop drawings, coating and lining identification numbers, routine maintenance and cleaning of all finishes applied and detailed procedures for repairs to finishes including: coating voids, scratches, abrasions, discontinuities and pinholes.
  2. A copy of a completed QA/QC Coating Inspection Log.
  3. Copies of all guarantees and warranties.
  4. Manufacturer's written procedures for repairs.
  5. Manufacturer's recommended recoat procedure.
  6. Copies of all Soil Sample and Spent Abrasive Sample Chain of Custody forms.
- E. Technical Service Representative Reports. These reports should typically record the temperature at the site, site observations, and actions being performed as well as any discussion held relative to the specifications and work being performed.

1.08 Guarantee

- A. Guarantee: There shall be a two year guarantee provided with two required inspection dates. Upon completion of the work the Contractor shall furnish to the Owner the guarantee/information containing but not limited to the following:

1. Written assurance from the Coating Manufacturer that all coatings and linings have been properly stored, handled, mixed and applied. A written assurance for all other tank appurtenances shall be provided by the appurtenance manufacturer.
2. All pertinent inspection forms assuring that hold points were observed and released by the Quality Assurance Representative.
3. One Year Inspection. An inspection of the structure shall be scheduled by the Owner prior to the one year anniversary of the accepted work. The inspection shall be conducted with representatives of the Owner, the Coating Contractor, the Coating Manufacturer's TSR (if required), and the third party inspector provided by the contractor. Scheduling of this inspection shall be at the discretion of the Owner.
4. Two Year Inspection. A final inspection of the structure shall be scheduled by the Owner prior to the two year anniversary of the accepted work. The inspection shall be conducted with representatives of the Owner, the Coating Contractor, the Coating Manufacturer's TSR (if required), and the third party inspector provided by the contractor. Scheduling of this inspection shall be at the discretion of the Owner. The final inspection shall cover all items including coatings, structure, and all other appurtenances.
5. Defects occurring within two years shall be repaired by the Contractor at the Contractor's expense. The remedial work shall include thorough surface preparation and coating/lining repair, or complete recoating of the defective area subject to approval of the Owner's representative. All coating and lining repairs shall be in accordance with the coating or lining manufacturer's detailed repair instructions, and the requirements of this specification.
  - a. The Owner shall drain the tank. The Contractor shall thoroughly wash out the tank.
  - b. The Contractor shall provide interior lighting, ventilation and rigging for the tank inspections.
  - c. Third Party inspection services will be arranged by the Contractor and shall be at his expense.

#### 1.09 Substitutions

- A. No substitution shall be considered that decreases or reduces the coating thickness specified; the number of coats required; changes the surface preparation specified or alters the generic type of coating specified.
- B. Substitute coating and lining manufacturers, if approved, must furnish the same colors as are available from the named manufacturers.
- C. Substitutions must fully meet or exceed performance requirements of the coating materials specified.

## 1.10 Service Environment Conditions

- A. Exterior:
  - 1. The following exposure zone is determined for exterior coating exposure: SSPC Zones 1B - Exterior Normally Dry and 2A - Frequently Wet by Fresh Water.
- B. Interior Dry:
  - 1. The following exposure zone is determined for interior dry coating exposure: SSPC Zones 1B - Exterior Normally Dry and 2A - Frequently Wet by Fresh Water.
- C. Interior Wet:
  - 1. The following exposure zone has been determined for immersion and splash zones: SSPC Zone 2C - Potable water immersion.

## PART TWO - PRODUCTS

### 2.01 Material Quality

- A. Provide primers, mist, intermediate and finish coating products produced by the same manufacturer. Where thinning is necessary to insure an acceptable finish, use only thinners recommended by the paint manufacturer, and use only to the manufacturer's recommended limits. Thinning of coating materials to be in contact with potable water shall not be permitted that exceeds allowable VOC, NSF or UL limits. Thinning shall not be permitted that exceeds allowable VOC limits or coating manufacturer's product data and detailed instructions.
- B. Provide coatings of durable and washable quality. Use coating materials which will withstand normal washing as required to remove airborne contaminants, oil, chemicals, etc., without showing discoloration, loss of gloss, staining and other damage.
- C. Coatings and linings shall have excellent adhesion and cohesion properties. Films shall dry and cure to uniform thickness and be free from pinholes, holidays, voids, discontinuities, dry spray, over spray, sags or runs. Finish coats shall be uniform in color, gloss and texture.

### 2.02 Materials Selection, Colors, and Labeling

- A. Contractor Responsibility

1. The Contractor shall furnish information to the Engineer by way of shop drawing submittal for the materials proposed to be used. If requested by the Engineer, the Contractor shall also secure a written statement from the coating manufacturer attesting to the compatibility of the proposed coating systems with the proposed material of the new elevated water tank.
  2. The Engineer will prepare a color schedule based on the Owner's selections (except where colors are already specified herein) and return the same to the Contractor along with the reviewed shop drawings.
  3. All materials shall be delivered to the site in manufacturer's sealed containers. Each container shall be labeled by the manufacturer. Labels shall give the manufacturer's name, brand, and type of material, material color, and instructions for reducing. Thinning shall be done only in accordance with directions of the manufacturer and exclusively with the types of reducer recommended.
- B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
1. Lead: Measurable lead content in either the pigment or binder will not be permitted.
  2. The finish coats on the tank shall match colors selected by the Owner.
  3. Where multiple coat exterior coating systems are specified, such as those with intermediate and finish coats, the initial coat(s) shall be tinted approximately 25% lighter in color than the next coat in order to maintain a consistent quality control reference for the applicator and to provide verification of coverage.
  4. Where multiple coat interior systems are specified, there shall be a color change between coats. This color change shall be with products that fully comply with NSF and UL Guidelines.
  5. If not otherwise scheduled, specified, or directed by the Owner, all color coding of piping, ducts and equipment shall comply with applicable standards of ANSI A13.1, OSHA 1910.144 and the Owner's color coding system.
- C. Finish Quality:
1. Finishes shall exhibit a high quality, commercial grade appearance of uniform thickness.
  2. Finishes shall be free of runs, sags, drips, waves, orange peel, festoons, dry spray, cloudiness, spotting, ropiness, brush marks, roller marks, fish eyes or other surface imperfections, voids, discontinuities, pinholes, and holidays.
  3. Final coat shall be uniform in texture, color and gloss, and shall provide an acceptable match with the approved drawdown color sample.

- A. Surfaces shall be clean, dry, and adequately protected from dampness. Surfaces shall be smooth, even, and true to plane. Surfaces shall be free of any material which will adversely affect adhesion or appearance of the coating. Cleanliness shall be checked by wiping the prepared steel surface with a white cloth dampened with manufacturers thinner for the particular coating system. If a dark spot appears on the rag from light wiping, the Contractor shall take steps to clean the surface more thoroughly before applying any coating materials.
- B. Interior Wet steel surfaces shall be prepared equivalent to SSPC-SP10, Near White Metal Blast Cleaning.
- C. Exterior and Interior Dry steel surfaces shall be prepared equivalent to SSPC-SP6 Commercial Blast Cleaning.
- D. All surfaces shall be clean and dry prior to coating. Abrasive blast cleaned surfaces shall be verified in accordance with SSPC-Vis 1Standards.
- E. Surface preparation shall follow the additional requirements as set forth throughout this specification and more specifically as covered in Sections 3.03, 3.05, 3.06, 3.08, and 3.11.

#### 2.04 Repair Products

- A. Repair (touch-up) coatings for all coating and lining products applied under this Contract that are used for finish coating shall be supplied by the Contractor and turned over to the Owner after the anniversary inspection.
- B. All containers shall be properly and thoroughly labeled. Labeling shall be neat and permanent. In addition to the standard label:
  - 1. Colors shall be named and the manufacturer's product and color numbers shown.
  - 2. Substrate to which the coating product is to be applied to shall be listed.
  - 3. Manufacturing date, date of purchase, batch number, and product shelf life expiration date shall be displayed.
- C. Repair products shall be furnished in the following quantities:
  - 1. Minimum Quantity:
    - a. Four (4) units shall be supplied for each product and each finish color applied.
    - b. Each unit to include one (1) gallon of single component products and two (2) gallons of multiple component products.
    - c. Packaging: One (1) quart containers.

## 2.05 Materials and Equipment for Inspection and Quality Control

- A. General: Prior to the beginning of any coating and lining or surface preparations, the Contractor shall supply the materials and equipment as listed in the following paragraph.
1. Each item shall be of construction, durable enough to last, through normal inspection use, for the life of this Contract.
  2. All materials and equipment shall be supplied to the Owner/Engineer for use during this contract.
    - a. All materials and equipment shall be returned to the Contractor after final acceptance of the Work.
  3. All equipment shall include complete operating instructions including calibration and adjustment directions.
- B. Inspection Materials and Equipment:
1. Wet Film Thickness Gauge:
    - a. Nordson S. G. Pinney Model W0001.00; Range 0 to 20 mils, or equivalent (KTA, eg.)
    - b. Quantity: 3 required.
  2. Surface Temperature Thermometer min/max.
    - a. S. G. Pinney Model THRPTC315FM dial thermometer 0°-150°F, or equivalent (KTA, eg.).
    - b. Quantity: 3 required.
  3. Paint Thermometer:
    - a. Taylor Paint Thermometer KTA-TATOR Model #6212, 25°-125°F, or equivalent.
    - b. Quantity: 2 required.
  4. Maximum/Minimum Thermometers:
    - a. S.G. Pinney Model No. THRPTC315FM 0° to 150°F, or equivalent (KTA, eg.).
    - b. Quantity: 2 required.

At the completion of the Contract the above equipment shall remain the property of the Contractor.



## PART THREE – EXECUTION

### 3.01 Examination and Verification of Condition

- A. Contractor shall examine the areas and conditions under which the work is to be performed and notify the Owner in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Do not coat over chalk, dust, dirt, rust, scale, moisture, oil, surface contaminants, coatings that have exceeded the manufacturers re-coat guidelines, or conditions otherwise detrimental to the formation of a durable, high quality coating system.

### 3.02 Safety and Regulatory Compliance

- A. The Owner's rules, policies and safety requirements shall be followed including:
  - 1. Hard hats are required to be worn in the work place.
  - 2. Safety shoes and safety goggles/glasses are required to be worn in the work place.
  - 3. Smoking within buildings and structures is strictly prohibited.
  - 4. Site parking shall be designated by the Owner.
- B. Compliance with the Owner's confined space entry and safety requirements shall be adhered to by the Contractor, his employees and subcontractors. The Contractor shall secure Confined Space Entry Permits from the Owner.
- C. Contractor shall ensure that all workers and others coming in contact with abrasive blasted and coated surfaces shall always wear clean gloves, clothing and shoe coverings. These measures are to prevent contamination of the abrasive blasted and coated surfaces. Compliance with all other measures to prevent contamination that may lead to premature coating and lining failure is the Contractor's responsibility. The Contractor shall provide gloves and disposable shoe coverings for his employees, the Owner's representatives and the consultant representatives.
- D. On behalf of the Owner, the Engineer will provide an inspector or may engage the services of an inspector to perform observation of the Work. The Contractor shall notify and make available to the inspector for observation of the fit-up of any new and/or replacement parts prior to welding and following post-weld cleanup. The Contractor shall notify and make available to the inspector for observation all surfaces to be coated. The dry film thickness (DFT) of each coat shall be measured in accordance with SSPC Paint Application System No. 2 (SSPC-PA 2). However, if it is determined to be in the best interest of the Owner, the inspector may make dry film thickness measurements in excess of the quantity stated in SSPC-PA 2 or in areas where DFT deficiencies are suspected.

### 3.03 General Preparation

#### A. Delivery of Materials:

1. Deliver all coating and lining materials, thinners and solvents to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information.
  - a. Name or title of material.
  - b. Manufacturer's stock number, batch number, and date of manufacture.
  - c. Manufacturer's name.
  - d. Contents by volume, for major pigment, binder (or resin) and vehicle constituents.
  - e. Thinning instructions where recommended.
  - f. Application instructions.
  - g. Color name and number.
  - h. Shelf life expiration date.
  - i. Pot life, at various ambient temperatures.
  - j. Material safety data sheet.
  - k. Volume and weight of container.
2. Deliver all cleaners in unopened containers which are labeled to indicate manufacturer and product.
3. Deliver all brushes and rollers in unopened packages which are labeled to indicate manufacturer and product.
4. Delivery of abrasive in bulk transfer trucks or abrasive manufacturer's bags or bulk nylon sacks, bearing the manufacturer's name, label and the following information:
  - a. Name of material.
  - b. Manufacturer's name.
  - c. Contents and net weight of the contents.
  - d. Mesh size of material.
  - e. Impurities or contaminants.

#### B. Storage of Materials:

1. Store only materials which have been previously approved for this Project on the job site.
  - a. Do not store non-approved materials on the job site.
  - b. Do not store materials for other projects with the materials for this Project.

2. Store all materials in a clean, dry, lighted and environmentally controlled area, such as a storage trailer, which shall be furnished and maintained by the Contractor.
  - a. Storage area shall be kept clean and accessible at all times throughout the durations of the Coating and Lining Work.
3. Comply with health, fire and OSHA regulations.
4. Maintain coating and lining material storage area between 60°F and 90°F at all times.
5. In the event the storage area temperature drops to 35°F or below, all paint and coating materials shall be declared unacceptable for this project. All such unacceptable material shall be immediately removed from the job site and replaced by the Contractor at no additional cost to the Owner.
6. Do not store coatings or lining materials in Owner's buildings or structures.

C. Handling of Materials:

1. Handle materials carefully to prevent inclusion of foreign materials, including abrasive dust and abrasives.
2. Do not open containers or mix components until necessary preparatory work has been completed, the appropriate inspection performed and the inspection hold point released. The application work shall immediately follow proper mixing and induction if required. The Owner shall be permitted to witness mixing and thinning and to monitor pot life of all coating and lining materials.

D. Protection:

1. Cover or protect all surfaces and equipment not being coated or not scheduled to be coated or painted, during all surface preparation and coating and lining work included under this Contract. This includes, but is not limited to the Owner's facilities, other private and public facilities within or adjacent to the area, other Contractor's equipment, and all publicly and privately owned vehicles.
2. Display prominent warning signs indicating "WARNING - PAINTING AND ABRASIVE BLASTING WORK UNDERWAY" throughout the job site wherever surface preparation or coating and lining operations are underway. Signs shall be at clearly visible locations near all points of access by person or vehicle to the job site and immediate work area.
3. Coating and Lining work, including surface preparation, shall not begin in any area until the Owner approves the protection plan and application techniques proposed by the Contractor. The Owner reserves the right to restrict coating and lining to those hours agreed upon and scheduled.
4. Take precautions necessary to prevent dust, dirt and moisture from coming in contact with surfaces cleaned for coating and lining and with surfaces

freshly painted. Protect freshly painted surfaces from dust/dirt moisture or other detrimental conditions throughout the initial drying period. Protect painted surfaces from dust, dirt, moisture and other contaminants detrimental to top coating.

5. Provide fire extinguishers and post caution signs warning against smoking and open flame when working with flammable materials.
6. Remove all temporary protective coverings provided for protection under this Contract immediately after completion of coating and lining operations.

3.04 Shop Pre-Cleaning and Surface Preparation of Metal Substrates

A. General:

1. The Contractor shall provide all labor, material and equipment to thoroughly pre-clean the substrate of the water tank as scheduled. The pre-cleaning is to include steel floors, walls, roof, underside of tank, risers, columns, bracing, flanges, base plates, gussets, and all appurtenances, all immersed and non-immersed ferrous steel and equipment to be coated.
2. Perform all pre-cleaning and surface preparation procedures as specified herein, as indicated by Schedule A and in strict accordance with the coating manufacturer's instructions for each particular substrate and environmental condition.

B. Pre-cleaning:

1. Pre-clean all interior and exterior ferrous surfaces, including structural steel, aluminum and miscellaneous metal fabrications, of all oil, grease, dirt, and other foreign matter in accordance with SSPC-SP1, Solvent Cleaning.
2. The cleaned surface will be inspected for removal of iron residue, magnesium residue, calcium, chalk, dirt and contaminants. Inspection shall comply with paragraph 3.11. The surface shall have neutrality in the range of 7.0 to 7.5 pH. The cleaned surface must be free of any chlorides. The surface must be free of any chalk, dirt, debris, oil, contaminants and any other foreign matter.

C. Surface Preparation:

1. General:

- a. The following industry standards are established for surface preparation work required by this Contract:

| NACE Number | SSPC Number | Surface Preparation Description |
|-------------|-------------|---------------------------------|
|             | SP 1        | Solvent Cleaning                |
|             | SP 3        | Power Tool Cleaning             |

|       |       |                                 |
|-------|-------|---------------------------------|
| No. 1 | SP 5  | White Metal Blast Cleaning      |
| No. 2 | SP 10 | Near-White Metal Blast Cleaning |
| No. 3 | SP 6  | Commercial Blast Cleaning       |
| No. 4 | SP 7  | Brush-Off Blast Cleaning        |

b. Prior to surface-preparation and coating operations, remove all hardware, hardware accessories, hand-hole covers, hatches, dedication plaques and similar items in order to facilitate the complete coating of the items and/or the adjacent surfaces. Tape and masking protection will be acceptable only where it is not possible to remove the hardware or fixture mentioned.

- 1) Following completion of coating of each area, clean and properly reinstall the removed items.
- 2) Replace all missing items removed for coating work.
- 3) Remove all protective masking and covering.
- 4) Replace all ferrous metal fasteners and washers with similar size stainless steel fasteners.

2. Power Tool Surface Preparation: Power tool cleaning shall be as follows:

- a. Power tool cleaning shall be in accordance with SSPC-SP3.
- b. The power tools shall be operated to remove and feather out peeling paint, chipped paint, rust, runs or other imperfections. Exposed edges shall have a radius to 1/8-inch by grinding.
- c. All areas that are cleaned with power tools shall be vacuum cleaned or wiped down to remove all dust and contamination that occurs during power tool cleaning.
- d. Exterior rusted and painted areas that are power tool cleaned and dusted off shall be spot primed and/or coated and not permitted to be left un-coated overnight. Exterior power tool cleaning shall be vacuum assisted whenever lead is present.

3. Abrasive Blast Surface Preparation: Surface preparation requiring abrasive blast cleaning shall be in accordance with the following requirements.

- a. Blast cleaning shall comply with the guidelines of the NACE International Society for Protective Coatings and the Coating/Lining Manufacturer's requirements.
- b. Dry abrasive blast cleaning techniques shall be utilized.
- c. The abrasives shall be maintained free from oil, dust, chemicals, salts and other impurities.
- d. The type and size of abrasive for a particular substrate shall be selected to give a properly prepared surface consistent with the

- anchor pattern of the scheduled coating system and the Coating/Lining Manufacturer's requirements.
- e. Compressed air supply used for blasting shall be free of oil, water, or other contaminants. Adequate separator traps and filters shall be provided, and shall be purged of oil and water throughout the blasting operation. Accumulations of oil and moisture shall also be removed from the auxiliary air receivers by regular purging.
  - f. Abrasive blasting shall not be conducted when the surface temperatures are less than 5°F above the dew point, or when the relative humidity of the surrounding air is greater than 85%. Refer to the U.S. Department of Commerce Weather Bureau, Psychometric Tables for dew points at various temperature/humidity conditions. Abrasive blasting may continue in controlled environments that comply with the specified conditions.
  - g. Abrasive blasted surfaces shall be coated as soon after the blasting work is completed as possible. In no case shall blast cleaned surfaces be allowed to stand overnight without being coated unless the affected area is dehumidified.
  - h. Abrasive blasting shall not be performed on any surfaces in close proximity to other surfaces which have recently been coated.
  - i. Protect all adjacent areas, surfaces and equipment not to be blast cleaned from blast over spray resulting from the blasting operations. Clean up all dust, grit, blasting residue and debris at the end of each workday.
  - j. Abrasive blasted surfaces shall be blown down with dry, oil-free, filtered air or by vacuum cleaning. Abrasive blasted surfaces will be inspected by the Third Party Inspector and/or the Owner's Representative and checked with the 2-inch wide clear cellophane tape test and the replica tape test. The surface shall be free of all residues, dust or other contamination that jeopardizes maximum adhesion of the coating.
  - k. Anchor profiles of abrasive blast shall be in accordance with the specific requirements of the base or prime coat to be applied.
    - 1) The Contractor shall verify that the anchor profile depth provided by blast cleaning operations is sufficient to maximize the adhesion and mechanical bonding of the prime coat. Prior to prime coat application, the Third Party Inspector and/or the Owner's Representative will verify anchor profile depth by measurement with Testex replica tape. This measurement will be taken following blow-down or vacuum cleaning.
    - 2) All surfaces shall be clean, dry and free of contaminants immediately prior to the application of the coating/lining material.

### 3.05 Field Pre-Cleaning and Surface Preparation of Metal Substrates

#### A. General:

1. The Contractor shall provide all labor, material and equipment to thoroughly pre-clean the interior and exterior of the water tank as scheduled. The pre-cleaning is to include steel floors, walls, roof, underside of tank, risers, columns, bracing, flanges, base plates, gussets, and all appurtenances, all immersed and non-immersed ferrous steel and equipment to be coated.
2. Perform all pre-cleaning and surface preparation procedures as specified herein, as indicated by Schedule A and in strict accordance with the coating manufacturer's instructions for each particular substrate and environmental condition.

#### B. Pre-cleaning:

1. Pre-clean all interior and exterior ferrous surfaces, including structural steel, aluminum and miscellaneous metal fabrications, of all oil, grease, dirt, and other foreign matter in accordance with SSPC-SP1, Solvent Cleaning.
2. The cleaned surface will be inspected for removal of iron residue, magnesium residue, calcium, chalk, dirt and contaminants. Inspection shall comply with paragraph 3.11. The surface shall have neutrality in the range of 7.0 to 7.5 pH. The cleaned surface must be free of any chlorides. The surface must be free of any chalk, dirt, debris, oil, contaminants and any other foreign matter.
3. The Contractor may use the (potable) water from the nearest hydrant, but the Contractor shall install a temporary reduced pressure back-flow preventer on the outlet of the hydrant.

#### C. Surface Preparation:

##### 1. General:

- a. The following industry standards are established for surface preparation work required by this Contract:

| NACE Number | SSPC Number | Surface Preparation Description |
|-------------|-------------|---------------------------------|
|             | SP 1        | Solvent Cleaning                |
|             | SP 3        | Power Tool Cleaning             |
| No. 1       | SP 5        | White Metal Blast Cleaning      |

|       |       |                                 |
|-------|-------|---------------------------------|
| No. 2 | SP 10 | Near-White Metal Blast Cleaning |
| No. 3 | SP 6  | Commercial Blast Cleaning       |
| No. 4 | SP 7  | Brush-Off Blast Cleaning        |

- b. Prior to surface-preparation and coating operations, remove all hardware, hardware accessories, hand-hole covers, hatches, dedication plaques and similar items in order to facilitate the complete coating of the items and/or the adjacent surfaces. Tape and masking protection will be acceptable only where it is not possible to remove the hardware or fixture mentioned.
  - 1) Following completion of coating of each area, clean and properly reinstall the removed items.
  - 2) Replace all missing items removed for coating work.
  - 3) Remove all protective masking and covering.
  - 4) Replace all ferrous metal fasteners and washers with similar size stainless steel fasteners.
  
- 2. Power Tool Surface Preparation: Power tool cleaning shall be as follows:
  - a. Power tool cleaning shall be in accordance with SSPC-SP3.
  - b. The power tools shall be operated to remove and feather out peeling paint, chipped paint, rust, runs or other imperfections. Exposed edges shall have a radius to 1/8-inch by grinding.
  - c. All areas that are cleaned with power tools shall be vacuum cleaned or wiped down to remove all dust and contamination that occurs during power tool cleaning.
  - d. Exterior rusted and painted areas that are power tool cleaned and dusted off shall be spot primed and/or coated and not permitted to be left un-coated overnight.
  
- 3. Field Abrasive Blast Surface Preparation: Comply with the requirements stated in paragraph 3.04

3.06 Weld and Metal Surface Repair

- A. General: The Contractor shall repair all surfaces, especially welds, and edges so that the surfaces are smoothly contoured and will not compromise the integrity or adhesion of the coating systems.
  - 1. Remove all weld spatter, slivers, flux deposits, unevenness, sharp projections, etc., by a systematic and uniform method by grinding in accordance with SSPC-SP3 to smooth welds to enhance adhesion of the coating. Follow grinding with power tool cleaning using a 3" or 4" belt



sander fitted with an 80 grit aluminum oxide grinding wheels or non-woven 3M-abrasive discs. Welds shall comply with NACE SP0178 butt weld designation "D". Designation of other weld types shall be approved by the Owner.

2. Fill all weld holes, voids and sharp indentations with additional weld material, and grind the surface smooth.
3. Welds which are specified to be continuous shall be truly continuous, and skip; tack or stitch welding techniques will not be permitted.
4. All weld area imperfections shall be corrected prior to surface cleaning and abrasive blasting.
5. Imperfections discovered after abrasive blasting, shall be corrected and re-blasted prior to coating/lining application.
6. Pits deeper than 0.125 inches and in clusters greater than 6 inches in diameter shall be plated over with 0.250 inch thick steel plate, seal welded to surface prior to surface preparation and coating application. Removal of spatter and curved welds and edges shall be included.

B. Weld Seam Repairs:

1. Repair weld seams in the tank in accordance with AWWA D100, Section 8, 10 and 11 or API No. 650 prior to stripe coat.
2. Seam welding shall be as required and included in the unit price bid for this coating work.

3.07 Preparation and Mixing of Coating Materials

- A. Mix coating material only in containers which have been placed in suitably sized non-ferrous (plastic) or new metal containers. Protect concrete, and the ground from splashes or spills during mixing of coating materials. Mix and store open containers and thinner on absorbent drop cloths over reinforced 6 mil polyethylene.
- B. Mix coating and lining materials only from properly stored containers bearing accurate product name and batch numbers of material being mixed or applied.
- C. Coating material which has livered, gelled, or otherwise deteriorated during storage shall not be used; however, thixotropic materials which must be stirred to obtain normal consistency are acceptable.
- D. Coating products with more than one component or part shall have each separate part thoroughly mixed prior to combining, mixing, and allowing for induction of the combined coating. Where several units of the finish materials are prepared for application at the same time, "boxing" of the several units is required.
- E. All stirring, mixing, boxing and induction shall be witnessed by the Owner or Owner's Representative and documented. Coating mixes not inspected and documented will not be approved for application.

- F. All coating materials shall be thoroughly mixed using a power mixer for sufficient time to thoroughly blend all components.
- G. Only thinners as specified by the coating manufacturer shall be used, and the previously approved mixing and thinning directions furnished by the coating manufacturer shall be strictly followed.
- H. Coating materials requiring the addition of a catalyst shall have the pot life clearly stated on the label. The pot life must be shown for the humidity and temperature ranges allowable under these specifications. Mixing of partial units of two component materials is strictly prohibited.
  - 1. The pot life must not be exceeded.
  - 2. When the pot life limit is reached, the coating application container must be emptied, the material discarded, the equipment cleaned and new material mixed and/or inducted.
  - 3. Mixing of partial units will not be allowed.
- I. Following induction, re-mix all materials before application to produce a mixture of uniform density. Mix as required during the application of the materials to maintain a uniform density.
- J. Do not stir any residue into newly mixed coating material.
- K. Coatings containing heavy or metallic pigments (zinc) that have a tendency to settle must be kept in suspension by a continuous agitating device.
- L. Coating materials shall be strained prior to application. The coating manufacturers detailed mixing and application instructions shall be followed. The coating manufacturer's recommended strainer size shall be used. Strainers shall be submitted for approval by the Engineer.
- M. Store those materials in use in covered containers. Maintain all containers used in the storage, mixing, and application of coatings in a clean condition, free of foreign materials, dust and residue.
- N. Adjust coating or lining material to the proper viscosity at ambient temperature and humidity in accordance with manufacturer's recommendations. Thinning must be done at the initiation of roller, brush or spray application, thinning of materials well into the pot life is strictly prohibited. Thinning in excess of VOC limits or NSF guidelines for interior lining material is strictly prohibited.
- O. Mixed coatings shall be covered during induction and during use to the greatest extent possible.

- P. Empty containers shall be stored until the NACE inspector approves of their removal and disposal by the Contractor.

### 3.08 Field Application of Interior Lining Materials

#### A. General:

1. Any surface to be coated or lined shall be rendered dust-free prior to the application of coating material. This shall be accomplished using oil-free, moisture-free, blow-down air or commercial vacuum cleaning equipment with tools that are kept clean throughout the project.
2. The interior surfaces of the tank shall be completely coated. The stripe coat shall be comprised of striping of all welds, edges, corners and fasteners, followed by spray application of the full wet coat to all surfaces.
3. Dehumidification will be incorporated into the project, all abrasive blasting shall be completed, surfaces shall be rendered dust free and the lining system shall be applied as specified.
4. Allow sufficient time between the striping and final coat to permit proper drying. Drying and curing of the entire lining system shall strictly follow the requirements of these specifications and the coating manufacturers detailed instructions.
5. Application shall be by qualified applicators. Applicators shall frequently check wet film thickness (WFT) with approved gauges. The gauges shall be Nordson, SGP or an approved equal machined gage. 'Credit Card' gauges are unacceptable.
6. Full-time ventilation must be provided during coating application and cure of interior coating system.

#### B. Environmental Requirements

1. The Contractor shall provide at least 100 foot candles of lighting uniformly applied to all areas and all surfaces being worked on. Such lighting shall be provided through the pre-cleaning, surface preparation, coating and lining application, drying, curing and inspection steps.
2. The Contractor shall be responsible for maintaining the interior of the tank with adequate ventilation and temperature control in accordance with OSHA regulations and in accordance with coating and lining manufacturer's product and application data throughout the project including the drying and curing time.
  - a. Do not apply coatings, linings or seam sealant to surfaces that have temperatures less than five (5) degrees above the dew point temperature or when the relative humidity is 85% or greater.

- b. Minimum air and surface temperatures shall be in accordance with the Manufacturer's published detailed guidelines and these specifications.
3. The Contractor shall provide continuous dehumidification of the tank interior during surface preparation, lining material application, drying and curing.
- a. The dehumidifier shall be of the solid desiccant (granular or loose lithium chloride) type capable of continuous operation with drip-proof, automatic electrical controller, designed to keep the air adjacent to surfaces to be cleaned and coated at a relative humidity of less than forty percent (40%).
  - b. The dehumidifier shall be capable of making one complete air change every thirty to forty minutes as a minimum.
  - c. All electrical connections between the power source and the dehumidifier equipment shall be furnished by the Contractor.
  - d. The dehumidifier shall be equal to a Munters Moisture Control Services honeycomb type desiccant dehumidifier with an auxiliary 60 kw electric heater or propane gas heater.
  - e. Desiccant regeneration (drying) may be by electric heaters or propane gas heaters.
  - f. All electricity, propane or any other fuel used shall be provided at the Contractor's expense.
4. The Contractor shall provide continuous dust collection, (negative air) with adequate filtering and air exchanges during the project.

3.09 Shop and Field Application of Interior and Exterior Coating

A. General:

- 1. Any surface to be coated shall be rendered dust-free prior to the application of coating material. This shall be accomplished using a vacuum or by being wiped down.
- 2. Apply coating materials by brush or roller in strict accordance with the manufacturer's detailed instructions and recommendations of Paint Application Specifications No. 1 in SSPC Vol. 2, where applicable. Use brushes or rollers best suited for the type of material being applied. Application shall be verified for the most desirable finish.
- 3. Exterior pre-cleaned, power tool cleaned and abrasive blast cleaned surfaces shall be coated with the products specified within 4 hours of completion of surface preparation (or shorter time limits as may be specified by the coating manufacturer). However, initial or prime coating of such surfaces shall always be accomplished prior to the end of the workday and 4 hours prior to the substrate going into dew point conditions.

4. It is acceptable to leave a 6 inch wide un-primed margin on the steel plate edge during shop priming to allow for field welding. Un-primed areas shall be blasted in the field to SSPC-SP10 conditions for interior wet surfaces and to SSPC-SP6 conditions for exterior and interior dry surfaces and then painted per Schedules A and B.
5. The total paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has dried or cured, **and has been inspected and approved.**
6. Apply each material at not less than the coating manufacturer's recommended spreading rate and provide the total dry film thickness specified in Schedule B. Apply additional coats, if required, to obtain the specified dry film thickness of each coat and total dry film thickness.
7. Application shall be by qualified applicators. Applicators shall frequently check wet film thickness (WFT) with approved gauges. The gauges shall be Nordson, SGP or an approved equal machined gage.
8. Brush-out and work all brush coats into the surfaces to provide an even film. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, dry spray, dry over spray or other surface imperfection will not be acceptable.
9. Neatly draw all color and break lines.
10. Stripe Coat all edges, corners, crevices, welds, rivets, and bolts by brush application. Ferrous metal shall be striped with the primer material prior to application of the complete prime coat. There is no acceptable alternate or substitute for brush applied striping. All striping shall extend a minimum of one inch from the edge, corner, weld, bolt or crevice. Striping material may be thinned to a maximum of 25% or less when so indicated by the Coating Manufacturer's product data or detailed instructions.
11. Allow sufficient time between successive coats to permit proper drying. Drying and curing of each coat and the entire coating system shall strictly follow the requirements of the coating manufacturer.
12. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the film is of uniform finish, color and appearance. Insure that all surfaces, including edges, corners, crevices, welds and exposed fasteners receive film thickness equivalent to that required on flat surfaces.

B. Environmental Requirements:

1. Apply water-base paints only when temperatures of the surface to be coated and the surrounding air temperature are in accordance with manufacturer's recommendations but in no case less than 50°F.
2. Apply coatings and linings other than water-based materials only when the temperature of surfaces to be painted and the surrounding air temperature and relative humidity are in accordance with manufacturer's recommendations but in no case less than 50°F.
3. Do not apply paint, coatings or linings to surfaces which have temperatures that are less than 5°F above the dew point. Dew points shall be determined

in accordance with Psychrometer testing and U.S. Department of Commerce, Weather Bureau, Psychrometric Tables.

### 3.10 Technical Service Representative

- A. Coating Manufacturer's Technical Service Representative (TSR) or Coating Contractor's qualified representative shall visit the site for the interior lining: on a weekly basis during the surface preparation and during the lining application phase of the work, and other times as required, in accordance with Section 1.06. The TSR shall be qualified as follows:
  - 1. The Coating Manufacturer's Technical Service Representative shall have five (5) years of high performance coating and lining experience.
  - 2. The Coating Manufacturer's Technical Service Representative shall be experienced in the coating system and surface preparation required by these specifications. The Contractor shall submit evidence of experience through the submittal process.
  - 3. The Coating Manufacturer's Technical Service Representative shall be thoroughly familiar with requirements of the NACE International Coating Inspector Training and Certification Program (NICITCP).
- B. For the exterior coating: on a weekly basis during the surface preparation and coating application phase of the work, the Coating Manufacturer's Technical Service Representative (TSR) or Coating Contractor's qualified representative shall visit the site on a scheduled basis to advise on suitability of surface preparation, materials, installation and finishing techniques. The weekly visit shall include a memorandum to the Owner, which summarizes the Representative's findings and recommendations.

### 3.11 Quality Assurance/Quality Control - Inspection

- A. The Contractor shall provide an independent third party NACE Certified Inspector to monitor his work. An outline of the entire inspection and quality control process is given below.
- B. The NACE Inspector on site, shall have, as a minimum, Basic Coating Inspection - Session I and 10 years of inspection experience.
- C. Costs for full compliance and cooperation with all inspection steps shall be included in the prices bid for the work. Should the Contractor fail to meet one of the following hold points, follow-up testing for the failed hold point shall be at the expense of the Contractor. Exceptions to this would be for one (1) follow up holiday test, after repairs of the holidays were made.
- D. Accessibility to work shall be arranged by the Contractor. The necessary rigging and hoisting shall be provided by the Contractor to make all areas of work available

to the inspector for inspection. The Contractor shall make every reasonable attempt to accommodate the NACE Inspector in the performance of the tests involved. The Contractor shall also have the applicator or superintendent available to interface with and assist with the inspection process.

- E. During rehabilitation work, the Contractor shall schedule all ‘hold point’ inspections with the Third Party Inspector and the Engineer. Should the Contractor schedule such a visit and not attend or be represented, the expenses associated with the Inspector’s visit and Engineer’s representative visit shall be the Contractor’s responsibility.
- F. The NACE Inspector will not allow coating or lining work over oil, dirt, rust, rust scale, mill scale, grease, moisture, or other contaminants detrimental to the formation and adhesion of a durable coating film or lining.
- G. The NACE Inspector will not allow coating over previous coats that have not sufficiently dried or that have exceeded the re-coat window as defined by the coating manufacturer's product data.
- H. Quality Assurance/Quality Control will conform to the NACE International Coating Inspectors Program.
- I. Coating Inspection Logs are required to be completed as part of the coating work.
- J. Quality Assurance/Quality Control inspection will include the following Hold Points for the Contractor. Prior to Field Pre-cleaning, NACE Inspector shall inspect all material delivered on site to document that shop applied materials meet the Project Specifications. Material that does not meet the requirements of the Project Specifications will be labeled unacceptable and removed from the site. Contractor shall provide certificates or other documentation stating that fabricated items meet or exceed the Project Specifications. Field coating and lining work may not proceed until conditions are checked by the NACE Inspector at each Hold Point, including ambient conditions.
  - 1. Hold Point 1: Following Field Pre-cleaning
  - 2. Hold Point 2: Prior to Field Power Tool Cleaning
  - 3. Hold Point 3: Following Field Power Tool Cleaning
  - 4. Hold Point 4: Following Weld and Metal Surface Repair
  - 5. Hold Point 5: Following Field Abrasive Blast Cleaning
  - 6. Hold Point 6: Prior to Field Prime Coat
  - 7. Hold Point 7: Prior to Intermediate Coat (or prior to each coat)
  - 8. Hold Point 8: Prior to Field Final Coat
- K. Inspection includes but is not limited to the following:

- 1. Pre-Cleaning Preparation:

- a. Emulsified high pressure cleaning, removal of the residual emulsion followed by pressure rinsing three or more times for protective coating and lining work. Emulsion cleaning in accordance with SSPC-SP1.
  - b. Emulsified cleaning, power scrubbing, and rinsing for interior work as specified.
  - c. Surface neutrality.
  - d. Chlorides.
  - e. Ferrous salts.
2. Ambient Conditions:
- a. Psychrometer.
  - b. Humidity.
  - c. Dew point.
  - d. Surface temperature.
  - e. Ambient temperature.
  - f. Wind speed.
  - g. Wind direction.
  - h. Maximum/minimum substrate temperature.
  - i. Maximum/minimum material storage area temperature.
3. Surface Preparation - Abrasive Blasting:
- a. Blotter test.
  - b. Nozzle bore/nozzle aperture.
  - c. Nozzle pressure.
  - d. Correct Abrasive Submitted:
    - 1) Shop drawing submittal, abrasive sample verified with materials delivered.
    - 2) Mesh size.
    - 3) Abrasive Vial Test.
  - e. NACE surface preparation visual comparison standards.
  - f. Visual comparison to the sample work piece.
  - g. Anchor pattern by testex tape.
  - h. Cellophane tape cleanliness verification of all cleaned surfaces.
4. Surface Preparation - Power Tool.
5. Weld Grinding:
- a. NACE visual comparison standards RPO 178.



6. Coating and Lining Applications:
- a. Ambient conditions as specified above.
  - b. Coating verification is compared with specifications and submittals.
  - c. Coating container numbers.
  - d. Coating batch numbers.
  - e. Coating mixing.
  - f. Coating induction time.
  - g. Coating temperature.
  - h. Moisture in porous substrates.
  - i. Coating application equipment.
  - j. Approval of substrate for coating.
  - k. Duration between power washing, rinsing and coating application.
  - l. Coating application.
  - m. Wet Film Thickness (WFT) (sample work piece, calibration work provided by Contractor).
  - n. Wet Film thickness of actual application .
  - o. Coating dryness.
  - p. Coating cure.
  - q. Dry Film Thickness (DFT) of the work piece in accordance with SSPC PA-2.
  - r. Suitability for additional coat/coats.
  - s. Progressive total DFT.

7. Completed Work:
- a. Final Cure: A satisfactory degree of cure is determined by solvent sensitivity testing and other recommendations of the coating/lining manufacturer. Thick film cure is determined by impression hardness.
  - b. Coating and lining cure verified.
  - c. Low voltage holiday detection.
  - d. High voltage holiday detection.
  - e. Adhesion testing if required by Owner. Repairs of damage by adhesion or other testing is the responsibility of the Contractor and shall be completed at no additional cost to the Owner.
  - f. Total DFT in accordance with specifications.
  - g. Correct imperfections including but not limited to the following:
    - 1) Pinholes/holidays/voids.
    - 2) Over spray.
    - 3) DFT too thin or thick.
    - 4) Defects cited.

- h. Thorough clean up completed.
- i. Punch list including touch up or final repairs completed.
- j. Documentation completed.

8. Final:

- a. Confirm completion of all punch list items.
- b. Confirm corrections, repairs, and clean up is completed.
- c. Verify full compliance with the specifications.

L. Defects. All defects exposed by inspections shall be corrected by the Contractor at no additional cost to the Owner. Should the defects require additional visits by the Third Party Inspector, this shall be done at the expense of the Contractor.

### 3.12 Cleanup

- A. During the progress of Work, remove from the work site and work areas all discarded materials, abrasive bags, rubbish and rags at the end of each work day. This material may be stored in a covered container (dumpster) for removal weekly or at the frequency required to keep the site clean, neat and orderly.
- B. Proper removal and disposal of coatings, linings, paints, and thinners is the Contractor's responsibility.
- C. Restore site to pre-job conditions, grass, restored ruts repaired, fencing.

### 3.13 Curing

- A. The Contractor is responsible for lining cure in accordance with the coating manufacturer's guidelines.
  - 1. The following curing conditions shall be met:
    - a. Length of cure.
    - b. Temperature during cure.
    - c. Relative humidity during cure.
    - d. Solvent sensitivity.
- B. Following documented cure, holiday detection testing will be performed by the Third Party Inspector. Any holidays shall be corrected.
- C. Maintain the interior of the tank in a sanitary condition during drying and curing of lining, prior to disinfection.

### 3.14 Disinfection

- A. Following the curing, the Contractor is responsible for the cleaning of the tank to the Owner's satisfaction. The Contractor may use water as directed by the Owner. The Contractor shall disinfect the structure in accordance with technical specification 33 16 19.20 and AWWA C652, Disinfection of Potable Water Storage Tanks.

3.15 Schedule A – Coating and Lining Work Requirements

A. Surfaces not to be painted

- 1. The following surfaces shall **not** be painted:
  - a. Safety climb rails. Contractor shall remove all paint spillage and splatter from safety rails and other surfaces where paint has fallen.
  - b. Electrical, instrument, signaling and other enclosures.
  - c. Flow-meters, sensors, gauges and all other instruments.
  - d. Nameplates.
  - e. Loading plaques and rating labels.
  - f. Concrete, unless specified elsewhere.
  - g. Stainless steel items.

B. Coating and Lining Work Required

- 1. Interior Wet and Immersion Exposure: (*FIELD APPLIED*)
  - a. Required on underside of roof of tank, top, side and bottom of bowl, wet riser pipe and on miscellaneous items such as ladders, roof hatches, and roof vents.
  - b. Work Required:
    - 1) Preclean: Comply with 3.05 B.
    - 2) Power Tool Clean: remove weld spatter and dress all welds. Comply with 3.05 C.
    - 3) Abrasive Blast: Comply with 3.05 C, provide a SSPC SP10 Near-White blast.
    - 4) Apply prime coat: Comply with 3.08 and Schedule B, Product A.3.
    - 5) Apply stripe coat: Apply striping by brush and mist coat. Comply with 3.08 and Schedule B, Product A.2.
    - 6) Apply intermediate and finish coats, apply a single, full wet coat in multiple passes to minimum DFT requirements: Comply with 3.08 and Schedule B, Product A. 4.

2. Interior Dry: (*SHOP APPLIED*)
  - a. Required on underside of bowl, rods, bracing, plates, dry riser pipe, brackets, platforms and other items located in the Dry Riser above ground level. Leave minimum of 2 inches for field erection of all members for field welding.
  - b. Work Required:
    - 1) Preclean: Comply with 3.04 B.
    - 2) Power Tool Clean: Comply with 3.04 C.
    - 3) Abrasive Blast: Comply with 3.04 C, provide a SSPC-SP 6 Commercial Blast Cleaning.
    - 4) Apply prime coat: Comply with 3.09 and Schedule B, Product C.2.
    - 5) Apply stripe coat: Apply striping by brush and mist coat Comply with 3.09 and Schedule B, Product C.4.
    - 6) Apply intermediate coat: Comply with 3.09 and Schedule B, Product C.3.
  - c. Finish Colors:
    - 1) As selected by the Owner.
3. Exterior Exposure: (*SHOP APPLIED*)
  - a. Required on all exterior exposed steel portions of tank including bowl, roof, fluted column, railings, hatches, vents, struts, flanges, bolts, nuts and all appurtenances.
  - b. Work Required:
    - 1) Shop Pre-clean: Comply with Section 3.04 B.
    - 2) Shop Abrasive Blast: Comply with Section 3.04 C, provide a SSPC-SP 6 Commercial Blast Cleaning.
    - 3) Apply Shop Primer: Comply with Section 3.09 and Schedule B, Product D. 2.
    - 4) Apply stripe and mist coat: Comply with Section 3.09 and Schedule B, Product D.2.
    - 5) Apply intermediate coat: Comply with Section 3.09 and Schedule B, Product D.3.
    - 6) Apply finish coat: Comply with Section 3.09 and Schedule B, Product D.4.
  - c. Finish Colors:
    - 1) Tank Exterior: As selected by the Owner.

4. Interior Dry: (**FIELD APPLIED**)
  - a. Required on underside of bowl, rods, bracing, plates, riser pipe, brackets, platforms and other items located in the Dry Riser above ground level where 2 inches for field erection for welds was left un-painted.
  - b. Work Required:
    - 1) Preclean: Comply with Section 3.05 B.
    - 2) Power Tool Clean: Comply with Section 3.05 C.
    - 3) Abrasive Blast: Comply with Section 3.05 C, provide a SSPC-SP 6 Commercial Blast Cleaning.
    - 4) Apply prime coat: Comply with Section 3.09 and Schedule B, Product C.2.
    - 5) Apply stripe coat: Apply striping by brush and mist coat Comply with Section 3.09 and Schedule B, Product C.2.
    - 6) Apply intermediate coat: Comply with Section 3.09 and Schedule B, Product C.3.
    - 7) Apply finish coat: Comply with Section 3.09 and Schedule B, Product C.3.
  - c. Finish Colors:
    - 1) Tank Exterior: As selected by the Owner.
5. Exterior Exposure: (**FIELD APPLIED**)
  - a. Required on all exterior exposed steel portions of tank including all appurtenances and accessories, where 2 inches for field erection for welds was left un-painted.
  - b. Work Required:
    - 1) Preclean: Comply with Section 3.05 B.
    - 2) Power Tool Clean: Comply with Section 3.05 C.
    - 3) Abrasive Blast: to be performed inside of containment. Comply with Section 3.05 C, provide a SSPC-SP 6 Commercial Blast Cleaning.
    - 4) Provide Weld and Metal Surface Repairs: provide pit filling, seam sealing and striping of weld seams, edges and corners. Blow down or vacuum clean all blasted areas prior to primer application. Comply with Section 3.06.
    - 5) Apply prime coat: Comply with Section 3.09 and Schedule B, Product D.2.

- 6) Apply stripe coat: Apply striping by brush and mist coat. Comply with Section 3.09 and Schedule B, Product D.2.
- 7) Apply intermediate coat: Comply with Section 3.09 and Schedule B, Product D.3.
- 8) Apply finish coat: Comply with Section 3.09 and Schedule B, Product D.4.
- 9) Apply top coat: Comply with Section 3.09 and Schedule B, Product D.5.

C. Tank Disinfection: Following coating work, the interior of the tank shall be cleaned and disinfected by the Contractor. Comply with 3.14.

3.16 Schedule B - Coating and Lining Products

A. Lining Products: Interior Wet and Immersion Exposure

1. General:

- a. "Immersion" refers to all interior surface areas of the water holding bowl of the tank, whether actually immersed or not.
- b. Total System DFT: 12.0 to 18.0 mils.
- c. System DFT Striped Areas: 13 to 23 mils.
- d. Maximum Spot DFT: 25.3 mils.
- e. Color change between coats is required.

2. Stripe Coat on Weld Seams, Edges and Fasteners:

- a. NSF-Epoxy.
- b. Minimum Solids Volume Content: 72%.
- c. VOC maximum: 3.06 lbs/gallon un-thinned.
- d. Acceptable Products:

| <u>Manufacturer</u> | <u>Paint System</u>       | <u>Dry Film Thickness (mils)</u> |
|---------------------|---------------------------|----------------------------------|
| Carboline           | Carboguard No. 61         | 4.0-6.0                          |
| Sherwin Williams    | Macropoxy 5500 or 646 PW  | 3.0-5.0                          |
| Tnemec              | Series N140 Pota-Pox Plus | 3.0-5.0                          |
| Or, Approved Equal  |                           |                                  |

- e. Thin to manufacturer's maximum allowable percent by volume.

3. Primer:

- a. NSF-Epoxy.

- b. Volume solids content minimum 72%.
- c. VOC Maximum 3.06 lbs/gallon un-thinned.
- d. Acceptable Products:

| <u>Manufacturer</u> | <u>Paint System</u>       | <u>Dry Film Thickness (mils)</u> |
|---------------------|---------------------------|----------------------------------|
| Carboline           | Carboguard No. 61         | 4.0-6.0                          |
| Sherwin Williams    | Macropoxy 5500 or 646 PW  | 3.0-5.0                          |
| Tnemec              | Series N140 Pota-Pox Plus | 3.0-5.0                          |
| Or, Approved Equal  |                           |                                  |

4. Intermediate and Finish Coats:

- a. NSF-Epoxy.
- b. Volume solids content minimum 72%.
- c. VOC maximum 3.06 lbs./gallon un-thinned.
- d. Acceptable products:

| <u>Manufacturer</u> | <u>Paint System</u>       | <u>Dry Film Thickness (mils)</u> |
|---------------------|---------------------------|----------------------------------|
| Carboline           | Carboguard No. 61         | 4.0-6.0                          |
| Sherwin Williams    | Macropoxy 5500 or 646 PW  | 3.0-6.0                          |
| Tnemec              | Series N140 Pota-Pox Plus | 4.0-6.0                          |
| Or, Approved Equal  |                           |                                  |

B. Sealants

1. Interior and Exterior Seam Sealer and Pit Filler:

| <u>Manufacturer</u> | <u>Paint System</u> | <u>Note</u>       |
|---------------------|---------------------|-------------------|
| Carboline           | No. 163-2           | 100% Solids Epoxy |
| Sherwin Williams    | Steel Seam FT-910   | 100% Solids Epoxy |
| Tnemec              | L3-1500             | 100% Solids Epoxy |
| Or, Approved Equal  |                     |                   |

C. Interior Dry

1. General:

- a. "Interior Dry" refers to all interior surface areas below the water holding bowl of the tank, down to the condensate ceiling, contained inside the fluted column of the tank.
- b. Total System DFT: 8.0 to 10.0 mils.
- c. Color change between coats is required.

2. Primer:

- a. NSF-epoxy.
- b. Volume solids content minimum 72%.
- c. VOC Maximum 3.06 lbs/gallon un-thinned.
- d. Acceptable Products:

| <u>Manufacturer</u> | <u>Paint System</u>       | <u>Dry Film Thickness (mils)</u> |
|---------------------|---------------------------|----------------------------------|
| Carboline           | Carboguard No. 61         | 4.0-6.0                          |
| Sherwin Williams    | Macropoxy 5500 or 646 PW  | 3.0-5.0                          |
| Tnemec              | Series N140 Pota-Pox Plus | 3.0-5.0                          |
| Or, Approved Equal  |                           |                                  |

3. Stripe Coat on Weld Seams, Edges and Fasteners:

- a. NSF-Epoxy.
- b. Volume solids content minimum: 72%.
- c. VOC maximum: 3.06 lbs/gallon unthinned.
- d. Acceptable Products:

| <u>Manufacturer</u> | <u>Paint System</u>       | <u>Dry Film Thickness (mils)</u> |
|---------------------|---------------------------|----------------------------------|
| Carboline           | Carboguard No. 61         | 4.0-6.0                          |
| Sherwin Williams    | Macropoxy 5500 or 646 PW  | 3.0-5.0                          |
| Tnemec              | Series N140 Pota-Pox Plus | 3.0-5.0                          |
| Or, Approved Equal  |                           |                                  |

4. Finish Coat:

- a. NSF-Epoxy.
- b. Volume solids content minimum: 72%.
- c. VOC maximum: 3.06 lbs/gallon un-thinned.
- d. Acceptable Products:



| <b><u>Manufacturer</u></b> | <b><u>Paint System</u></b> | <b><u>Dry Film Thickness (mils)</u></b> |
|----------------------------|----------------------------|---|
| Carboline                  | Carboguard No. 61          | 4.0-6.0                                 |
| Sherwin Williams           | Macropoxy 5500 or 646 PW   | 3.0-6.0                                 |
| Tnemec                     | Series N140 Pota-Pox Plus  | 4.0-6.0                                 |
| Or, Approved Equal         |                            |   |

D. Tank Exterior:

1. General:

- a. "Exterior" applies to all exposures not in contact with potable water or not covered under "interior".
- b. Tank System DFT: 11.0 to 18.0 mils.
- c. Color change between coats is required.

2. Primer:

- a. Organic Zinc-Rich
- b. Volume solids content minimum: 63%.
- c. VOC maximum: 3.96 lbs/gal un-thinned
- d. Acceptable Products:

| <b><u>Manufacturer</u></b> | <b><u>Paint System</u></b> | <b><u>Dry Film Thickness (mils)</u></b> |
|----------------------------|----------------------------|---|
| Carboline                  | Carbozinc 859              | 3.0-5.0                                 |
| Sherwin Williams           | Corothane I GalvaPak       | 2.5-3.5                                 |
| Tnemec                     | Tneme-Zinc 90-97           | 2.5-3.5                                 |
| Or, Approved Equal         |                            |   |

3. Intermediate Coat:

- a. NSF-Epoxy.
- b. Volume solids content minimum: 54% (mixed).
- c. VOC maximum: 3.04 lbs/gallon un-thinned.
- d. Acceptable Products:

| <b><u>Manufacturer</u></b> | <b><u>Paint System</u></b>       | <b><u>Dry Film Thickness (mils)</u></b> |
|----------------------------|----------------------------------|---|
| Carboline                  | Carboguard 893 SG                | 3.0-5.0                                 |
| Sherwin Williams           | Macropoxy 5500 or 646 PW         | 2.5-4.0                                 |
| Tnemec                     | Series N69 Hi-Build Epoxoline II | 2.5-4.0                                 |

|                    |  |  |
|--------------------|--|--|
| Or, Approved Equal |  |  |
|--------------------|--|--|

4. Finish Coat:

- a. High solids aliphatic acrylic polyurethane.
- b. Volume solids content minimum: 65% (mixed).
- c. VOC maximum: 2.4lbs/gallon un-thinned.
- d. Acceptable Products:

| <u>Manufacturer</u> | <u>Paint System</u>                        | <u>Dry Film Thickness (mils)</u> |
|---------------------|--|----------------------------------|
| Carboline           | Carbothane 134 HG                          | 2.0-2.5                          |
| Sherwin Williams    | Acrolon 218 HS or<br>HiSolids Polyurethane | 2.5-5.0                          |
| Tnemec              | Series 1075,<br>Endura-Shield              | 2.5-5.0                          |
| Or, Approved Equal  |  |                                  |

End of Section



NEW MADISON, OHIO WATER TOWER – SITE ACCESS

- ★ EX. AGG. ACCESS
- ★ OPTIONAL ACCESS