CABAZON WATER DISTRICT CONTRACT DOCUMENTS FOR RESERVOIR NO. 1 INTERIOR RECOATING

ADDENDUM NO. 2

PLEASE BE ADVISED:

The following clarifications, changes, additions, and/or corrections hereinafter set forth shall be incorporated into the project Contract Documents, and shall be made a part thereof, subject to all the requirements thereof, as if originally specified and/or shown.

1. Bidder Clarification and Instructions to Bidders, Pre-Bid Conference:

Replace the Pre-Bid Conference with the following

A mandatory Pre-Bid Conference is scheduled for **Monday**, **September 9**, **2020**, **at 1:00 p.m.** to review the Project's existing conditions at 14618 Broadway, Cabazon, CA 92230. Representatives of the District and consulting engineers, if any, will be present. Questions asked by Bidders at the Pre-Bid Conference not specifically addressed within the Contract shall be answered in writing, and shall be sent to all Bidders present at the Pre-Bid Conference. A second Mandatory Pre-Bid Meeting will be held on **Monday**, **September 21**, **2020 at 10:00 a.m.** Bidders who attended the first (September 9) Mandatory Pre-Bid Conference.

QUESTIONS AND ANSWERS

- 1. Q: What is the anticipated start date?
 - A: The District anticipates awarding the project approximately 2 weeks after bid opening. Following award, the start date of construction would depend on the Contractor's diligence in executing the Contract.
- 2. Q: Who will be the coatings inspector, if any? Will they hire a 3rd party inspector?
 - A: The District will arrange for and will be providing a coating inspector to inspect the work.
- 3. Q: Is there an inspection report available for this tank?
 - A: A copy of a "Coating Evaluation" Report is attached.
- 4. Q: We'd like to request adding the additional business license classification to allow us to provide all the necessary services for both the tank and well bid. Could you add the following language to the bid forms (see in red)?

Page 2 of 2 of 4 Tank 1 Rehab Bid:

Tank Project: Unless otherwise provided in the Instructions for Bidders, each Bidder shall be a licensed contractor pursuant to sections 7000 et seq. of the Business and Professions Code in the following classification(s) throughout the time it submits its Bid and for the duration of the Contract: Class C-33 and Class-A.

Page 2 of 2 of 4 Notice Inviting Bids:

Well Project: Unless otherwise provided in the Instructions for Bidders, each Bidder and/or its subcontractor shall be a licensed contractor pursuant to sections 7000 et seq. of the Business and Professions Code in the following classification(s) throughout the time it submits its Bid and for the duration of the Contract: Class C-57.

A: A Class C-33 license will be required by the Bidder. The Contract Documents will remain as-is.



By:_

Sabrina A. Nies, RCE No. 71524

Date: September 22, 2020

ADDENDUM NO. 2 ACKNOWLEDGEMENT

Bidder hereby acknowledges receipt of Addendum No. 2 and the incorporation thereof in bid proposal for the Reservoir No. 1 Interior Recoating. This signed acknowledgement shall be included in the bid proposal.

Bidder:_____

Date:_____

683-11P8-Addendum No. 2

Attachment: Coating Evaluation

By:___

(Bidder's Authorized Representative)

Title:_____



P.O. Box 801357 Santa Clarita, CA 91380-2316 Phone: 877.274.2422 Fax: 661.775.7628 www.CSIservices.biz

Providing Quality Technical Services to the Coating Industry

January 3, 2020

Mr. Calvin Louie General Manager Cabazon Water District 14618 Broadway Street Cabazon, CA 92230 Office: (951) 849-4442 E-mail: clouie@cabazonwater.org

Subject: Final Report – Coating Evaluation

Re: 1MG Water Tank Evaluation in Cabazon, CA

Dear Sinnaro:

Please find attached the Final Report for the coating evaluation that was completed on the above referenced project. Please let us know if you have any questions or comments. I can be reached through e-mail at <u>rgordon@csiservices.biz</u> or by cell at 951.663.5440.

Sincerely, CSI Services, Inc.

N. Randy Gordon

Project Manager



P.O. Box 801357, Santa Clarita, CA 91380 877-274-2422

Final Report Coating Evaluation

1MG Water Storage Tank





Prepared for:

Mr. Calvin Louie Cabazon Water District 14618 Broadway Street Cabazon, CA 92230

Prepared by: CSI Services, Inc.

N. Randy

N. Randy Gordon Project Manager

January 3, 2020

Hawaiian Office: PO Box 671, Aiea, HI 96701Northern California Office: PO Box 371, Sonoma, CA 95476Coating Specialists and Inspection Services, Inc.ngEvaluationsTank Diving

Consulting

Inspection



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- CSI Chart 1 General Description of Conditions
- CSI Chart 2 Rust Grade Criteria
- CSI Chart 3 Corrosion Grade Criteria
- CSI Chart 5 Coating Adhesion Criteria



Introduction

CSI Services, Inc. (CSI) was contracted by Cabazon Water District to evaluate the condition of the interior lining that had recently been applied to the interior of a 1MG water storage tank. CSI is a third-party independent consulting engineering firm that specializes in evaluations with specific expertise in protective coatings. The company is an SSPC QP5 certified coating inspection firm that provides many different coating related services including failure analysis, expert witness testimony, evaluations, in-process inspection, and testing. Mr. Randy Gordon, CSI Project Manager completed the assignment. Mr. Gordon is a NACE Level 3 Coatings Inspector, SSPC Protective Coating Specialist with over thirty (30) years' experience as a coating professional. The condition of the newly applied interior coating system and its suitability for the intended service (immersion in potable water) was the focus of this evaluation. Photos were taken and are included in a Photo Summary.

Summary

It is not clear what the contracted tank lining work required, but it is clear that the most recently applied coating has many different types of failures that will result in the new coating not providing proper performance. The defects observed are a result of problems with both the level of surface preparation completed and the application of the new coating. In order to assure that the tank has a properly installed lining, the newly installed lining requires removal and replacement.

Background

The Cabazon 1MG Tank is located behind the Morongo Casino, to the east of Millard Pass Rd, Cabazon, CA 92230 with GPS Coordinates as 33.926117, -116.788543. According to the tank's nameplate, the structure was erected in 1996 by Trusco Tank, Inc. and is a cone roof, welded steel, aboveground water storage tank with a diameter of 86 feet and a shell height of 27 feet.

At the time of the inspection, CSI made inquiry into the procurement documents or written agreement that may have provided a specification or submittal by which the coating could be evaluated against, but no historical information was made available. Although no documents were provided, a pile of refuse left behind from the recent application work was discovered during the site visit. Found amongst the debris were several empty cans of Sherwin Williams (SW) Macropoxy 5500 (B58 VX740), SW High Solids Compliant Thinner #1 (R7K111), and SW High Solids Reducer #10 (Methyl Ethyl Keytone). Batch numbers imprinted upon the empty pails of Macropoxy 5500 were partially obscured and unreadable. For the purpose of this evaluation, CSI assumes that the SW Macropoxy 5500 technical data sheets were used as the specified requirements for the project. The SW Macropoxy 5500 technical data sheet establishes the criteria by which carbon steel surfaces are to be cleaned prior to the application of the product (see attachment).



The minimum recommended surface preparation for immersion service is SSPC SP-10, Near-White Metal Blast Cleaning. A near-white metal blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter. Random staining shall be limited to no more than 5 percent of each unit area of surface and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating. It is understood from project personnel that the original, existing lining was not removed prior to the recent application and that this removal of the existing coating was a SW recommendation.

Field Evaluation

The evaluation involved visual observations (both with and without magnification), nondestructive testing, and destructive testing. The evaluation was completed after the tank was drained and made accessible by others. The inspection was flat-footed in that all surfaces were observed from the tank bottom or adjacent to the shell ladder. A rating system has been developed to quantify the condition of the coatings. Each of the rating criteria is found in attached charts.

The condition of the paint systems was rated as being poor, fair, good, or excellent (Chart 1, warranty). The extent of any rust defects on a structure was generally determined using the guidelines set forth in ASTM D610 "Standard Test Method for Evaluating the Degree of Rusting of Painted Steel Surfaces" (Chart 2). Where applicable, the characteristic or stage of corrosion was determined according to CSI Corrosion Grade criteria (Chart 3). Paint adhesion was assessed in accordance with ASTM D3359 "Standard Test Method for Evaluating Adhesion by Tape Test, modified Method A or ASTM D6677 "Standard Test Method for Evaluating Adhesion by Knife" (Chart 5). Dry film thickness (DFT) measurements were obtained using a Positector 6000 FN3 Type II gage in accordance with ASTM D7091 "Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals" and the applicable requirements of SSPC-PA2 "Procedure for Determining Conformance to Dry Coating Thickness Requirements." The results of the evaluation follow:

Upon entry into the tank, attention was immediately drawn to the area adjacent to the interior ladder area where numerous large coating pieces were found resting on the tank floor. The pieces of lining were as large as 12 square inches in size and had disbonded from the upper shell adjacent to the ladder at about the mean water level if the tank was in operation. The backside of the coating pieces had a soft, dark, and sticky residue similar to an oil. The pieces were measured with a micrometer and found to be in excess of 50 mils (0.050") thick.

The newly applied lining system was in poor condition (Chart 1, Warranty). Visual examination of the upper shell adjacent to the ladder identified the same oily residue on



an older, underlying coating. It was noted that the oil residue on the shell did not appear to have any indication of attempted cleaning (i.e. the oily film was uniformly consistent without wipe marks). It was also noted that the circumference of the shell at this same height had a cracked coating.

Examination of the shell surfaces indicate that perhaps two application methods were employed by the applicator; airless spray and rolling. The airless spray application lacked proper atomization in some locations which left behind an inconsistent film thickness, dry spray, overspray, runs, sags and other application defects. Other areas the coating appear to have been applied with a 9-inch roller and this method left thousands of roller fibers embedded in the film.

Although some dark rust (CSI Corrosion Grade 2) was common to the edges of the roof plates and roof support structure, visual observations below the roof did not note any rusting locations (ASTM D610, 10). Adhesion of the newly applied lining to the existing coating ranged from between 2A and 4A (ASTM D3359), and the weak link in the total coating system was between the new and older, existing coating. The thickness of the total coating system (i.e. existing and newly applied) at locations that had not disbonded measured between 16 to 28 mils.

Conclusion

It is not clear what the contracted tank lining work required, but it is clear that the most recently applied coating has many different types of failures that will result in the new coating not providing proper performance. The most notable defect is the disbonding lining from the upper shell surfaces where the coating was applied over oil contamination. Although the obvious failure involves applying coatings over improperly prepared surfaces, there are also other defects that extend from improper application.

The existing coating does not meet the requirements set forth by Sherwin Williams (SW). The minimum level of surface preparation required that all surfaces to be coated must be clean, dry, and in sound condition. SW defines this level of preparation as one that removes all oil, dust, grease, dirt, loose rust, and other foreign material. For surfaces taken to bare metal that will be immersed, the minimum requirement is that the surface must be abrasive blasted to an SSPC-SP10 "Near-White Blast Cleanliness" with a 2-4 mil profile. These requirements were not met. Further, the disbonded newly applied lining was measured in excess of 50 mils thick, but the maximum thickness allowed by SW for potable water service is 28 mils. This indicates that the lining system applied does not meet the NSF ANSI 61 certification for contact with potable water.

NOTICE: This report represents the opinion of CSI Services, Inc. This report is issued in conformance with generally acceptable industry practices. While customary precautions were taken to ensure that the information gathered and presented is accurate, complete and technically correct, it is based on the information, data, time, and materials afforded. While the inspections were performed in accordance with industry standard practices and a reasonable indication of proper serviceability has been provided.



Photo Summary

Photo 1 – Exterior – Overview of the Cabazon 1MG Tank



Photo 2 – Exterior – Refuse pile discovered upon arrival to the site.

Photo 3 – Exterior – Refuse pile indicates Sherwin Williams Macropoxy 5500 was the material the Contractor applied at the shell and the floor.



Photo 4 – Exterior – Tank erector nameplate.

Photo 5 – Interior – Overview of roof structure where it appears the Contractor performed no work. CSI believes the roof to be the existing coating from 1996.

10 0 0

Photo 6 – Interior – View of roof/shell juncture where delaminating paint was observed near the access ladder.



Photo 7 – Interior – View of the upper shell course which exhibits an inconsistent sheen.



Photo 9 – Interior – View of entrained debris in the coating.



Photo 10 – Interior – View of lower shell course with entrained debris.



Photo 11 – Interior – View of roller application drips, splatter, runs and sags on the shell and floor.

Photo 12 – Interior – View of an area of overspray.



Photo 13 – Interior – View of paint drips and splatters upon the floor surfaces.



Photo 14 – Interior – View of drips and splatters upon the floor surfaces.

Photo 15 – Interior – View of the exterior side of the mono-bolt manway that exhibits numerous paint defects.



Photo 16 – Interior – View of lower shell course adjacent to the manway which exhibits improper spray application.



Photo 17 – Interior – View of a shell coupling with adjacent coating defects.

Photo 18 – Interior – View of an areas where coating sags exist in the coating.



Photo 19 – Interior – View of coating pieces sitting on the tank floor around the access ladder.

Photo 20 – Interior – View of the backside of the disbonded coating chips which had a dark oily residue on their backside.

Photo 21 – Interior – View of the area that has generated the coating prices that had fallen to the tank bottom. This major areas of defects is at an apparent mean water level when the tank is in service.





Photo 22 – Interior – View of cracked, disbonded coating at the tank's mean water level – away from the obvious failures adjacent to the ladder.

Photo 23 – Interior – View of another area of fractured and disbonded coating.

Photo 24 – Interior – View of another area of fractured and disbonded coating.



Photo 25 – Interior – Overview of the tank's internal overflow pipe.



Photo 26 – Interior – Closeup of the coating at the overflow pip with coated over debris.

Photo 27 – Interior – Closeup of the coating at the overflow pip with holidays present around the bolts. Excessive lining rust are also in view.



Photo 28 – Interior – Closeup view of the coating at the overflow pipe penetration at the floor with excessive coating thickness and defects.



Photo 29 – Interior – View of one of eight a CSI test area with DFT and adhesion results.

Photo 30 – Interior – View of an adhesion test with indications of a cohesive weak bond between an older and new coating.



<u>Chart 1 - Condition Rating</u> The table below gives a basic description of the four different categories that CSI Services, Inc. uses to provide a general depiction of the condition of each defined area of a structure. The categories are Poor, Fair, Good, or Excellent. The development of these categories is based on historical knowledge and experience of various paint and lining systems over given periods of time in certain service environments. Basically, the rating is determined based on what should be expected of the paint or lining system at that point in its life cycle. As a result, different determinations are made for maintenance inspection versus warranty inspections. A detailed description of each rating with relative consideration addressed follows:

| Poting | General Description of Conditions | | | | |
|-----------|--|---|--|--|--|
| Kating | Maintenance Inspection | Warranty Inspection | | | |
| Poor | This condition is usually prioritized for rework in the short-term. Typically, these surfaces have considerably more coating defects and/or corrosion than what is expected for the age of the system. | This condition identifies an area with wholesale coating defects or corrosion concerns that will typically require significant removal and replacement of the coatings in the area. | | | |
| Fair | Typically, these surfaces have a level of coating defects and/or corrosion that is slightly worse than what should be expected for the age of the system. This condition is placed on a short-term monitoring schedule. | This condition identifies an area with partial coating defects or corrosion concerns that will require significant rework. | | | |
| Good | This condition is rated for areas without any considerable coating defects or corrosion. These surfaces are in a condition that is typical for the age of the coating system. | This condition identifies areas with coating defects or corrosion that is typically seen in one-year warranty inspections. Typically, only minor spot repairs are required. | | | |
| Excellent | This condition is for areas without any considerable coating defects or corrosion. Typically, these surfaces are in a condition that is better than expected for the age of the system. | This condition identified areas that typically are in perfect condition and require no repair work. | | | |



Chart 2 -Rust Grade The black and white figures below depict the standards referenced in ASTM D610 "Standard Test Method for Evaluating Degree of Rusting on Painted Surfaces." Below each standard is a photographic depiction of each level of corrosion, as used by CSI Services, Inc. The standards depict the percentage of rust on a scale from 0 to 10, with 10 having no rust and 0 having complete rust.



Rust Grade 5

Rust Grade 4 Rust Grade 3

Rust Grade 2

Rust Grade 1



Rust Grade 0

| Rust Grade | Description |
|------------|---|
| 10 | No rusting or less than 0.01% of surface rusted |
| 9 | Minute rusting, less than 0.03% of surface rusted |
| 8 | Few isolated rust spots, less than 0.1% of surface rusted |
| 7 | Less than 0.3% of surface rusted |
| 6 | Excessive rust spots, but less than1% of surface rusted |
| 5 | Rusting to the extent of 3% of surface rusted |
| 4 | Rusting to the extent of 10% of surface rusted |
| 3 | Approximately one-sixth of the surface rusted |
| 2 | Approximately one-third of the surface rusted |
| 1 | Approximately one-half of the surface rusted |
| 0 | Approximately 100% of the surface rusted |

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Chart 3 - Corrosion Grade The figure below depicts the photographic standards referenced by CSI Services, Inc. in the determination of the characteristics and stages of corrosion progression. This standard is used to better quantify the level of corrosion once it has progressed to Rust Grades 3, 2, 1, or 0 (see Chart 2). When applicable, CSI classifies an area as one or more of the five different Corrosion Grades. Corrosion Grades 1 through 5 are described below:

| Grade | Description | Photo Examples |
|-------|---|----------------|
| 1 | Light Rust - This condition involves relatively light colored rust that does not have any significant metal loss. | |
| 2 | Dark Rust -This condition involves relatively dark colored, thicker rust that is progressing towards the next phase, significant metal loss. | |
| 3 | Pitting - This condition involves isolated or widespread deep spot corrosion (pitting). | |
| 4 | Scale - Also known as lamellar or exfoliation corrosion. The edges of the affected area are leaf like and resemble the separated pages of a wetted book. | |
| 5 | Structural Loss - This condition involves metal loss or failure where components will require structural consideration | |

The photos depicted are examples and were not taken on this project.



Chart 5 - Adhesion Rating The figures below depict the photographic standards and criteria referenced in ASTM D3359 "Standard Test Method for Evaluating Adhesion by Tape Test" and ASTM D6677 "Standard Test Method for Evaluating Adhesion by Knife." Both Standards are used to assess the condition of a paint system for life-cycle projections. It is also used to evaluate an existing paint system's ability to withstand the added stress that any overcoating strategies can create. Depending upon the thickness of the paint system, ASTM D3359 has two different test methods. The rating criteria for both standards follow:

| ASTM D3359 | | | | | |
|------------|---|--|--------|-------------------------|--|
| Method A | | Method B | | | |
| Rating | Observation | Surface of X-cut from which flaking/peeling has occurred | Rating | Percent Area Removed | Surface of cross-cut area from which flaking has occurred for six parallel cuts and adhesion range by percent |
| 5A | No peeling or removal | None | 5B | 0% none | |
| 4A | Trace peeling or removal along incisions or their intersection | X X X | 4B | Less than 5% | |
| 3A | Jagged Removal along incisions up to 1/16" on either side | X X X | 3B | 5 – 15% | |
| 2A | Jagged removal along most of incisions up to 1/8" on either side | X X X | 2B | 15 – 35% | |
| 1A | Removal from most of the area of the X under the tape | \times | 1B | 35-65% | |
| 0A | Removal beyond the area of the X | | 0B | Greater than 65% | |

| ASTM D6677 | | | |
|------------|---|--|--|
| Rating | Description | | |
| 10 | Fragments no larger than $\frac{1}{32}$ " x $\frac{1}{32}$ " can be removed with difficulty | | |
| 8 | Chips up to $\frac{1}{8}$ " x $\frac{1}{8}$ " can be removed with difficulty | | |
| 6 | Chips up to $\frac{1}{4}$ " x $\frac{1}{4}$ " can be removed with slight difficulty | | |
| 4 | Chips larger than $\frac{1}{4}$ " x $\frac{1}{4}$ " can be removed with slight pressure | | |
| 2 | Once coating removal is initiated by knife, it can be peeled at least $\frac{1}{4}$ " | | |
| 0 | Coating can be peeled easily to length greater than $\frac{1}{4}$ " | | |



MACROPOXY® 5500 LOW VOC POTABLE WATER EPOXY

PART A PART B PART B B58-X740 B58VX740 B58VX745

SERIES HARDENER OAP HARDENER

| PRODUCT | I NFORMATION |
|---------|---------------------|
| | |

| Revised: Nov. 02, 2015 | PRODUCT IN | NFORMATION | | 4.86 |
|--|---|---|--|--|
| P RODUCT D ESCRIPTI | ON | PRODUCT | Characteristic | cs (cont'd) |
| MACROPOXY 5500 is a high solids, polyamidoamine of for potable water storage tanks. Superior spray and per MACROPOXY 5500 ideal for field or shop applications. • Low odor, Low VOC • Outstanding application properties | epoxy tank lining developed erformance properties make | Topcoats Drying | Schedule @ 10.0 mils v @ 50°F/10°C @ 2 hours | vet (250 microns): 0 77°F/25°C @ 100°F/38° 50% RH 1.5 hours 1 hour |
| Recommended for potable water | | To handle: | 24 hours | 16 hours 5 hours |
| P RODUCT C HARACTERI | STICS | io recoat: minin | um: 48 hours | 16 hours 5 hours |
| Finish: Semi-Gloss Color: Red Primer; White, Light Blue Volume Solids: 74% ± 2%, mixed Weight Solids: 82% ± 2%, mixed VOC (EPA Method 24): < 100 g/L; 0.83 lb/gal Mix Ratio: 1:1 by volume | e and Beige Topcoats | maxin Cure for: If maximum recoat time | num: 3 months sion: 14 days* e is exceeded, abrade su | 3 months 3 months 7 days 7 days urface before recoating. |
| Primer Recommended Spreading R | ate per coat: | Pot Life: | ature, numiaity, and film 3 hours | 1.5 hours 1 hour |
| B58RX740 Minimu | um Maximum | Sweat-in-time: *For Potable Water Servi | None ce, allow a minimum of | None None 7 days at/above 77°F |
| Wet mils (microns) 3.0 (7) Dry mils (microns) 2.0 (5) ~Coverage sq ft/gal (m²/L) 197 (4) Theoretical coverage sq ft/gal (m²/L) 1187 (2) @ 1 mil / 25 microns dft 1187 (2) | 5) 8.0 (200) 0) 6.0 (150) .8) 593 (14.4) 9.1) | (25°C) cure to service. Ste Shelf Life: Flash Point: Reducer/Clean Up: | 24 months, unopener 24 months, unopener Store indoors at 40°F 75°F (24°C), Seta Fla Reducer R7K111 | WA C652. d : (4.5°C) to 100°F (38°C). ash, mixed |
| NOTE: Brush or roll application may require multipu mum film thickness and uniformity of a | le coats to achieve maxi- | RE | COMMENDED U | SES |
| Primer Drying Schedule @ 6.0 mils we B58RX740 @ 50°F/10°C @ 77' 50° 50° 50° To touch: 2 hours 15 | t (150 microns): F/25°C @ 100°F/38°C % RH bours 1 bours | For potable water service, Water treatment plants Complies with AWWA D10 Complies with AWWA D10 | consult WWW.NSF.ORG 2 for ICS #1, #2, & #5; fo 2 Meets the requirements | r OCS #5 & #6 s of AWWA C210 |
| To handle: 24 hours 16 | hours 5 hours | Perform | MANCE CHARACT | ERISTICS |
| Io recoat: minimum: 48 hours 16 l maximum: 3 months 3 m Cure for: immersion: 14 days* 7 c If maximum recoat time is exceeded, abrade sun Drving time is temperature, humidity, and film th | hours 5 hours onths 3 months days 7 days face before recoating. nickness dependent. | Substrate*: Steel Surface Preparation*: SSP(System Tested*: 1 ct. Macropoxy 5500 @ 6 *unless otherwise noted below | C-SP10/NACE 2 .0 mils (150 microns) dft | |
| Pot Life: 3 hours 1.5 | hours 1 hour | Test Name | Test Method | Results |
| Sweat-in-time: None None *For Potable Water Service, allow a minimum of 7 (25°C) cure to service. Sterilize and rinse per AWW | one None days at/above 77°F /A C652. | Abrasion Resistance | ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load | 120 mg loss |
| Toposto Possmmondod Sproading | Bata par agati | Adhesion | ASTM D4541 | >1700 psi |
| Minimu Wet mils (microns) 8.0 (20) | Maximum 00) 18.0 (400) | Corrosion Weathering | ASTM D5894, 36 cycle 12,000 hours | Rating 10 per ASTM D714 for blistering; Rating 9 per ASTM D616 for rusting |
| Dry mils (microns) 6.0 (1 | 50) 14.0 (350) | Direct Impact Resistance | ASTM D2794 | 30 in. lb. |
| Coverage sq ft/gal (m²/L) 79 (1.) | .9) 197 (4.8) | Dry Heat Resistance | ASTM D2485 | 250°F(121°C) |
| (21) (21) | 9.1) | Flexibility | ASTM D522, 180° bend 1" mandrel | ^{d,} Pass |
| mum film thickness and uniformity of a | appearance. | Humidity Resistance | ASTM D4585, 6000 ho | urs No blistering, crackir or rusting |
| | | Immersion | 18 months fresh and sa water | Rating 10 per ASTM D714 for blistering; Rating 10 per ASTM D616 for rusting |

Pencil Hardness ASTM D3363 4H Epoxy coatings may darken or discolor following application and curing. Above are typical results and should not be construed as a specification.





PART A **B58-X740** B58VX740 B58VX745 PART B PART B

SERIES HARDENER OAP HARDENER

Revised: Nov. 02, 2015

PRODUCT INFORMATION

4.86 SURFACE PREPARATION **Recommended Systems** Dry Film Thickness / ct. Surface must be clean, dry, and in sound condition. Remove all oil, **Immersion and Atmospheric:** Mils (Microns) dust, grease, dirt, loose rust, and other foreign material to ensure **Ductile Iron Pipe:** adequate adhesion. Shop Applied: 1-2 cts. Macropoxy 5500LT Refer to product Application Bulletin for detailed surface prepara-6.0-14.0 (150 - 350)tion information. or Field Applied: 1 ct. Macropoxy 5500 or 5500 Primer 3.0-14.0 (75 - 350)Minimum recommended surface preparation: 1 ct. Macropoxy 5500 6.0-14.0 (150 - 350)Iron & Steel Atmospheric: SSPC-SP2/3 SSPC-SP10/NACE 2, 2-4 mil Steel: Immersion: (150-350) 2-3 cts. Macropoxy 5500 6.0-14.0* (50-100 micron) profile Ductile Iron Pipe: NAPF 500.03.03 or Surface Preparation Standards 1 ct Macropoxy 5500 Primer 2.0 - 6.0(50-150)Condition Surface ISO 8501-1 BS7079:A1 Swedish Std. SIS055900 ondition of (150-350) 1-3 cts. Macropoxy 5500 6.0-14.0* SSPC NACE Sa 3 Sa 2.5 Sa 2 Sa 2 C St 2 D St 2 C St 3 D St 3 White Metal Near White Metal Commercial Blast Brush-Off Blast Sa 3 Sa 2.5 Sa 2 SP 5 SP 10 SP 6 SP 7 SP 2 5 10 2004 Potable Water, Immersion, Steel: Sa 1 C St 2 D St 2 C St 3 D St 3 Rusted Pitted & Rusted Rusted *AWWA D102: Inside Coating System No. 1 Hand Tool Cleaning SP SP 2 minimum AWWA 8.0 (200)Power Tool Cleaning Pitted & Rusted 1 ct. Macropoxy 5500 30 (75)1 ct. Macropoxy 5500 5.0 (125)TINTING *AWWA D102: Inside Coating System No. 2 Do not Tint. minimum AWWA 12.0 (300)**APPLICATION CONDITIONS** 1 ct. Macropoxy 5500 3.0 (75)1 ct. Macropoxy 5500 40 (100)Surface / Material 50°F (10°C minimum, 120°F (50°C) 1 ct. Macropoxy 5500 50 (125)maximum with surface temp 5°F Temperature: (2.8°C) above dew point AWWA D012: Inside Coating System No. 3 1ct. Macropoxy 5500 Primer 2.0 mils (50) Air Temperature: 50°F (10°C) minimum, 100°F (38°C) 1ct. SherPlate PW 20.0 mils (500)maximum AWWA D102: Inside Coating System No. 4 Relative Humidity: 85% maximum. At least 5°F (2.8°C) 1ct. Macropoxy 5500 Primer 2.0 mils (50)above dew point 1ct. SherFlex S 30.0 mils (750) **O**RDERING INFORMATION AWWA D102: Inside Coating System No. 5 1ct. Corothane I Galvapac Zinc 2.0 mils (50) Packaging: 1ct. Macropoxy 5500 4.0 mils (100)Part A: 1 gallon (3.78L) and 5 gallon (18.9L) 1ct. Macropox 5500 4.0 mils (100)containers Part B: 1 gallon (3.78L) and 5 gallon (18.9L) Acceptable for use with AWWA D102: Component of Outside Coating containers System No. 5 and No. 6 Weight: 13.3 ± 0.2 lb/gal; 1.6 Kg/L, mixed, may Other acceptable topcoats over Macropoxy 5500 Primer: vary by color Dura-Plate UHS **SAFETY PRECAUTIONS** *Maximum of 28.0 mils (700 microns) for entire system Refer to the MSDS sheet before use. Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions. The systems listed above are representative of the product's use, other systems may be appropriate. WARRANTY DISCLAIMER The Sherwin-Williams Company warrants our products to be free of manufactur-ing defects in accord with applicable Sherwin-Williams quality control procedures. The information and recommendations set forth in this Product Data Sheet are Liability for products proven defective, if any, is limited to replacement of the defec-tive product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MER-CHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-

Williams representative to obtain the most recent Product Data Information and

Application Bulletin.



MACROPOXY® 5500 LOW VOC POTABLE WATER EPOXY

 PART A
 B58-X740

 PART B
 B58VX740

 PART B
 B58VX745

Series Hardener OAP Hardener

Revised: Nov. 02, 2015

APPLICATION BULLETIN

4.86

SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Carbon Steel, Immersion Service:

The surface shall be abrasive blasted to SSPC-SP10/NACE No. 2 Near-White Blast Cleaning with a 2-4 mil (50-100 micron) profile. The anchor profile shall be sharp with no evidence of a peen surface. The finished surface shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter with no more than 5% staining. After blasting, all dust and loose residue should be removed from the surface by acceptable means. Coat steel the same day as it is prepared and prior to the formation of rust.

Iron & Steel: Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Prime any bare steel within 8 hours or before flash rusting occurs.

Ductile Iron Pipe: Minimum surface preparation is Power Tool Clean per NAPF 500.03.02. Remove all oil and grease from surface by Solvent Cleaning per NAPF 500.03.01. For better performance, use Blast Cleaning per NAPF 500.03.03, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile. Prime any bare DIP before flash rusting occurs.

| Surface Preparation Standards | | | | | |
|--|---------------------------|--------------------------------|--------------------------------|-------------------------------|------------------|
| | Condition of Surface | ISO 8501-1 BS7079:A1 | Swedish Std. SIS055900 | SSPC | NACE |
| White Metal Near White Metal Commercial Blast Brush-Off Blast | | Sa 3 Sa 2.5 Sa 2 Sa 1 | Sa 3 Sa 2.5 Sa 2 Sa 1 | SP 5 SP 10 SP 6 SP 7 | 1 2 3 4 |
| Hand Tool Cleaning | Rusted & Rusted | C St 2 D St 2 | C St 2 D St 2 | SP 2 | - |
| Power Tool Cleaning | Rusted Pitted & Pusted | Č Št 3 | C St 3 | SP 3 | - |

Application Conditions

Temperature:

50°F (10°C) minimum, 120°F (50°C) maximum (air, surface, and material) At least 5°F (2.8°C) above dew point

Relative humidity:

85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean UpReducer R7K111

Airless Spray

| Pressure | 2700-3000 psi |
|-----------|-------------------------------|
| Hose | 3/8" ID with 1/4" whip |
| Тір | 519-525 |
| Filter | none |
| Reduction | As needed up to 10% by volume |

Brush

| Brush | Nylon/Polyester or Natural Bristle |
|-----------|------------------------------------|
| Reduction | As needed up to 10% by volume |

Roller

| Cover | 3/8" woven with solvent resistant c | ore |
|-----------|-------------------------------------|-----|
| Reduction | As needed up to 10% by volume | |

If specific application equipment is not listed above, equivalent equipment may be substituted.



MACROPOXY® 5500 LOW VOC POTABLE WATER EPOXY

 PART A
 B58-X740

 PART B
 B58VX740

 PART B
 B58VX745

Series Hardener OAP Hardener

| Revised: Nov. 02 | 2, 2015 | | AF | PLICATIC | N BULLETIN 4.86 | |
|--|-------------------------|--|---|--|---|--|
| Application Procedures | | | | | CLEAN UP INSTRUCTIONS | |
| Surface preparation must be completed as indicated. Mix contents of each component thoroughly with low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine one part by volume of Part A with one part by volume of Part P. Thereweble estimates the minimum | | | | | Clean spills and spatters immediately with R7K111. Clean tools immediately after use with R7K111. Follow manufacturer's safety recommendations when using any solvent. | |
| with power agitation. | | | | | Performance Tips | |
| If reducer solvent is used, add only after both components have been thoroughly mixed | | | | | Note: Once maxiumum pot life is exceeded, product may be sprayable | |
| Apply paint at the reco below: | mmended fi | Im thicknes | s and spreading | g rate as indicated | but will not hold sag. Strine coat all crevices, welds, and sharp angles to prevent early failure in | |
| Primer Recommended Spreading Rate per coat: | | | | | these areas. | |
| B58RX7 | 740 | | Vinimum | Maximum | When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray | |
| Wet mils (microns) | | : | 3.0 (75) | 8.0 (200) | ăt a right angle. | |
| Dry mils (microns)2.0 (50)6.0 (150)Spreading rates an application lo ity of the surfac plication, variou spillage, over theTheoretical coverage sq ft/gal (m²/L)197 (4.8)593 (14.4)Spreading rates an application lo ity of the surfac plication, variou spillage, over the | | | Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, rough-ness or poros- ity of the surface, skill and technique of the applicator, method of ap- plication, various surface irregularities, material lost during mixing, spillage over thinning climatic conditions and excessive film build | | | |
| NOTE: Brush or roll application may i maximum film thickness and u | | | ire multiple coa rmity of appear | ats to achieve ance. | Excessive reduction of material can affect film build, appearance, and | |
| Primer Drving Schedule @ 6.0 mils wet (150 microns): | | | | | adhesion. | |
| | | 50°E/10°C | @ 77°E/25°C | @ 100°E/38°C | Do not mix previously catalyzed material with new. | |
| B30RA740 | (U) : | 50 F/10 C | 50% RH | @ 100 F/38 C | Do not apply the material beyond recommended pot life. | |
| To touch: | 2 | 2 hours | 1.5 hours | 1 hour 5 hours | In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer R7K111. | |
| To recoat: | 2 | - Hours | 10 110013 | 0 110013 | Tinting is not recommended for immersion service. | |
| mi | nimum: 4 | 8 hours | 16 hours | 5 hours | Do not use Quik-Kick Epoxy Accelerator. | |
| ma Cure for: | ximum: 3 | months | 3 months | 3 months | Insufficient ventilation, incomplete mixing, miscatalyzation, and external heaters may cause premature yellowing. | |
| If maximum recoat time is exceeded, abrade surface before recoating. | | | | | Excessive film build, poor ventilation, and cool temperatures may cause | |
| Drying time is temperature, humidity, and film thickness dependent. | | | | | plication procedures. | |
| Pot Life: Sweat-in-time: | | 3 hours None | 1.5 hours None | 1 hour None | For Immersion Service: Electrical holiday inspection should be perform | |
| *For Potable Water Serv service. Sterilize and rin | ninimum of 7 o C652. | m of 7 days at/above 77°F (25°C) cure to | | lin accordance with NACE SP 0188 "Discontinuity (Holiday) Testing of Protec- tive Coatings" or ASTM D 5162-91 "Standard Practice for Discontinuity (Hol- iday) Testing of Non-conductive Protective Coating of Metallic Substrates." | | |
| Topcoats Recommended Spreading Rate per coat: | | | | | Refer to Product Information sheet for additional performance charac- | |
| | | r | Vinimum | Maximum | teristics and properties. | |
| Wet mils (microns) | | | 8.0 (200) 6.0 (150) | 18.0 (400) 14.0 (350) | SAFETY PRECAUTIONS | |
| ~Coverage sq ft/gal (m ² | ²/L) | | 79 (1.9) | 197 (4.8) | Refer to the MSDS sheet before use. | |
| Theoretical coverage sq ft/gal (m ² /L) @ 1 1187 (29.1) | | | | | Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions. | |
| NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance. | | | | | | |
| Topcoats Drying Schedule @ 10.0 mils wet (250 microns): | | | | | Disclaimer | |
| | 0 | 0 50°F/10°C | @ 77°F/25°C | @ 100°F/38°C | The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. | |
| To touch: | | 2 hours | 50% RH 1.5 hours | 1 hour | Such information and recommendations set forth herein are subject to change and | |
| To handle: To recoat: | | 24 hours | 16 hours | 5 hours | Williams representative to obtain the most recent Product Data Information and | |
| m | ninimum: aximum: | 48 hours 3 months | 16 hours 3 months | 5 hours 3 months | Application Bulletin. | |
| Cure for: | | 14 do:* | 7 | 7 -1 | WARRANTY | |
| If maximum recoat time is exceeded, abrade surface before recoating. | | | | | The Sherwin-Williams Company warrants our products to be free of manufactur- | |
| Drying time is temperature, humidity, and film thickness dependent. | | | | | Liability for products proven defective, if any is limited to replacement of the defec- | |
| Pot Life: | | 3 hours | 1.5 hours | 1 hour | tive product or the refund of the purchase price paid for the defective product as | |
| Sweat-in-time: | vice allow c ~ | None | None | None Storiliza and | determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE | |
| rou rougue water service, allow a minimum of 7 days cure to service. Sterilize and rinse per AWWA C652. | | | | | STATUTORY, BY OPERATION OF LAW OR OTHERWIS, INCLUDING MER- CHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. | |

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.