

SP00594 (Special Provisions for the 2024 Book)

(Bidding on or after: ~~095-01-265~~

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This Section requires SP00084 when a coating system warranty is required in subsection .75.

Requires SP00253 when work access/containment is required.

Requires SP00296 when lead is anticipated.)

SECTION 00594 - PREPARING AND COATING METAL STRUCTURES

(Follow all instructions and make all edits with "Track Changes" turned on. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the project. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)

Comply with Section 00594 of the Standard Specifications modified as follows:

(Use the following subsection .00 when coating any structures that require a more detailed scope – e.g. bridges, sign structures, ornamental rail, if lead based coatings are involved, etc.)

00594.00 Scope - Replace this subsection, except for the subsection number and title, with the following:

This Work consists of preparing and coating existing steel on Bridge No. _____.

(Insert bridge/scope description here – i.e. length, number of spans, general area to be coated (above or below deck), etc. Provide previous coating history including materials used and surface preparation if known. Obtain information from the Designer.)

(Use the following paragraph when mill scale will be exposed by this work.)

Mill scale will be exposed by the preparation and coating Work.

(Use the following paragraph when lead-based coating will be affected by the work.)

Lead-based coatings will be affected by the preparation and coating Work.

(Use the following paragraph when chromates will be affected by the work.)

Coatings that contain chromates will be affected by the preparation and coating work.

00594.01(b) Definitions - Replace the paragraph that begins "Hold Point ..." with the following paragraph:

Hold Point - A time when the Contractor is required to stop a particular activity until a phase of Work is inspected or tested. If the Engineer finds this phase conforms to the Specifications, the subsequent phase of Work may proceed.

Replace the paragraph that begins "**Paint** ..." with the following paragraph:

Paint - A pigmented liquid, applied as a thin layer, that is converted to a solid colored film after curing. This film provides a decorative and protective Coating to the Substrate. The binder is a resin that may or may not be modified with natural vegetable oils, fish oils, or other ingredients.

Replace the paragraph that begins "**Skimming** ..." with the following paragraph:

Skimming - The process where a film forms over a liquid Coating, either during storage or after application.

Replace the paragraph that begins "**Substrate** ..." with the following paragraph:

Substrate - A surface where a Coating is to be applied. This may be the prepared surface of the metal Structure or a previous Coating.

00594.01(c) References - Replace the paragraph that begins "In these Specifications, references ..." with the following paragraph:

In these Specifications, references are made to FTMS 141, *Paint, Varnish, Lacquers, and Related Materials: Methods of Inspection, Sampling and Testing*, that is distributed by the U.S. General Services Administration.

(Use the following subsection .05 when lead is anticipated on the project.)

00594.05 Waste Handling and Disposal - Add the following paragraph to the end of this subsection:

When lead is contained in the waste, dispose of waste material according to 00290.20, Section 00296, and the applicable requirements of SSPC-Guide 7.

(Use the following subsection .10 to list coating materials. Obtain information from the Designer. Use the appropriate QPL subsection for the classification of work [i.e. non-ferrous, weathering steel, rehab, maintenance, high performance, shop, shop pile].)

00594.10 Materials - Add the following to the end of the subsection:

(Fill in the first blank with a description of the work item and the second blank with the bridge number. Use the appropriate QPL subsection for the classification of work (i.e. non-ferrous, weathering steel, rehab, maintenance, high performance, shop, shop pile).

Example:

For steel pipe pile at Bent No. 1 on Bridge No. 01234A:

Furnish a shop pile coating, 4 coat system with tar from the QPL. Provide top-coat color that conforms to #27038 of SAE AMS-STD-595.

Repeat the following language as necessary for multiple bridges, work items, coating systems, colors, etc.)

For _____ on Bridge No. _____:

Furnish a _____ coating, _____ coat system with _____ from the QPL. Provide top-coat color that conforms to # _____ of SAE AMS-STD-595.

(Use the following paragraph when weatherized guardrail and painting of guardrail transitions and terminals are required according to SP00810.)

Furnish coating materials for metal galvanized guardrail transition and guardrail terminal materials according to Non-Steel Metallic Substrates except the color shall be brown that closely matches aged weatherized steel. Submit samples to the Engineer for review and approval.

00594.10(b) Color - Replace the paragraph that begins "Unless otherwise specified ..." with the following paragraph:

Unless otherwise specified, furnish top-coat color according to the following colors:

00594.11(b) Packaging - Replace the bullet that begins "If necessary, constructed ..." with the following bullet:

- If necessary, constructed with an interior lining to prevent attack by the Coating Material. Furnish container wall lining that does not delaminate and contaminate the Coating.

00594.11(d) Slip-Critical Connections - Replace this subsection, except for the subsection number and title, with the following:

Furnish a primer Coat on steel-to-steel contact surfaces at all slip-critical structural bolted connections using high strength bolts according to Class B (slip coefficient of 0.5) Coating requirements in *Test Method to Determine the Slip Coefficient for Coatings Used in Bolted Joints*, as adopted by the Research Council on Structural Connections.

00594.12 Caulking - Replace the paragraph that begins "Furnish structural steel ..." with the following paragraph:

Furnish structural steel caulking from the QPL and approved for use by the Coating manufacturer. Furnish a caulking color that is clear, approximate the color of the top Coating, or be over coated.

00594.30 Quality Control Personnel - Replace this subsection, except for the subsection number and title, with the following:

Provide an on-site quality control manager who is responsible for managing quality control related to all Preparation and Coating quality control activities. Provide a quality control manager that is not employed in a supervisory role for any Preparation or Coating Work.

(Use the following subsection .40(b) when coating existing steel structures. Obtain information from the Designer.)

00594.40(b) Existing Steel Structures - Add the following paragraphs and bullets to the end of this subsection:

Prepare and coat the following surfaces:

(List below what is to be coated.)

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Do not coat the following:

(List below what is not to be coated.)

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(Use the following subsection .40(d) when existing non-steel metallic substrates are to be coated. Obtain information from the Designer.)

00594.40(d) Non-Steel Metallic Substrates - Add the following paragraph and bullets to the end of this subsection:

Existing non-steel metallic substrates to be prepared and coated include:

(List below what existing non-steel metallic substrates are to be coated.)

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00594.42(a) New Steel Structures - Replace this subsection, except for the subsection number and title, with the following:

Clean new steel Structure surfaces to be coated according to SSPC-SP 10 / NACE No. 2 Near White Metal Blast Cleaning, except as modified by this Section. Closely approximate the appearance of the final blast-cleaned surface to Pictorial Standard SP 10 of SSPC-Vis 1.

00594.42(c) Rehabilitation of Existing Steel Structures - Replace this subsection, except for the subsection number and title, with the following:

When performing Rehabilitation on a Structure that is not receiving a Maintenance Coating outside the immediate area of the Rehabilitation details, prepare all existing steel surfaces to be coated according to SSPC-SP 15, Commercial Grade Power Tool Cleaning. Provide a cleaned surface with a minimum Surface Profile of 1 mil.

Prepare all existing coated surfaces exposed by the removal of the existing components involved in the Rehabilitation, all areas that rivets, bolts, or plates are to be removed, and

areas damaged by erection or other Contractor operations. Completely clean all existing lead-based Coatings exposed by the removal of any structural or miscellaneous member to SSPC-SP 15 *Commercial Grade Power Tool Cleaning* requirements. Extend all prepared areas at least 2 inches into tightly adhering, intact paint. Overlap the subsequent Coating and the still intact Coating by a minimum of 2 inches. Lightly sand the overlap area of the intact Coating to provide a profile for the subsequent repair Coating to adhere to.

00594.42(e)(1) Cleaning Methods - Replace the paragraph that begins "Surfaces shall be ..." with the following paragraph:

Dry surfaces before Cleaning unless a wet blast Cleaning method is used. Use methods specified in SSPC-SP 1, *Solvent Cleaning*, SSPC-SP 2, *Hand Tool Cleaning*, SSPC-SP 3, *Power Tool Cleaning*, and SSPC-SP 15 *Commercial Grade Power Tool Clean*, as necessary to augment blast-cleaning.

00594.42(e)(2) Abrasives - Replace the paragraph that begins "Perform blast-cleaning using ..." with the following paragraph:

Perform blast-cleaning using an abrasive of a size that will continually produce an angular Surface Profile of at least 1 mil, but not more than 4 mils, as measured according to ASTM D4417 using replica tape on the prepared surface. Perform blast-cleaning that results in a roughened steel surface comparable to a Keane-Tator Surface Profile Comparator for sand or grit using ASTM D4417.

Replace the paragraph that begins "Provide abrasives that have ..." with the following paragraph:

Provide abrasives that have no corrosion products, water, oil, or any other material detrimental to the application and adherence of the Coatings. Provide abrasives according to SSPC-AB 1. When directed, test cleanliness according to ASTM D7393 and ASTM D4940. Do not exceed 100 microsiemens per centimeter for the conductivity results from ASTM D4940. Wet abrasives are allowed if wet sandblasting methods are used.

(Use the following subsection .42(e-7) when coating existing steel within 2 miles of a salt water source or when required by the Designer.)

Add the following subsection:

00594.42(e)(7) Soluble Salt Testing and Removal - Conduct soluble salt tests on all cleaned surfaces, except locations where rust inhibitors, chloride removers, or lead/chromate-treating abrasive additives are used, in accordance with SSPC *Technology Guide 15*, Section 4.1.1. Conduct tests after final blow down, before any coating application, and on the same Day as the coating operation. Follow all of the recommendations and instructions from the test equipment manufacturer. Convert soluble salt measurements to a standard temperature of 77 °F using a temperature correction factor of 1.11 percent per °F. Perform three tests for the first 1000 square feet cleaned each Day, and one test for each subsequent 1000 square feet cleaned, with a minimum of two tests per work shift. Perform tests at the locations identified by the Engineer. The Engineer may perform additional soluble salt testing. The maximum acceptable concentration of soluble salts is 70 microsiemen per centimeter. If the total concentration of soluble salts found in any test exceeds allowable limits, the entire area represented by the test will be rejected. Provide additional surface

cleaning in rejected areas before repeating the tests. Each area will be accepted when all soluble salt test readings in the area are within acceptable limits.

For areas where rust inhibitors, chloride removers, or lead/chromate-treating abrasive additives are used, test all cleaned surfaces for the presence of soluble salts in accordance with SSPC *Technology Guide 15*, Section 5.2.5.1. Follow all of the recommendations and instructions from the test equipment manufacturer. Perform three tests for the first 1000 square feet cleaned each Day, and one test for each subsequent 1000 square feet cleaned, with a minimum of two tests per work shift. Perform tests at the locations identified by the Engineer. The Engineer may perform additional soluble salt testing. The maximum acceptable concentration of soluble salts is 5 micrograms per square centimeter. If the total concentration of soluble salts found in any test exceeds allowable limits, the entire area represented by the test will be rejected. Provide additional surface cleaning in rejected areas before repeating the tests. Each area will be accepted when all soluble salt test readings in the area are within acceptable limits.

00594.43(b)(3) Thinning - Replace this subsection, except for the subsection number and title, with the following:

Do not add additional Thinner at the application site unless approved by the Engineer. If allowed, furnish the amount and type of Thinner according to the Manufacturer's Recommendations.

00594.43(c)(2) Application Methods - Replace the paragraph that begins "Apply Coating Materials ..." with the following paragraph:

Apply Coating Materials by air or airless spray, brush, roller, any combination of these methods, or as recommended by the Coating Material manufacturer, unless otherwise specified. If air is used for application, ensure that it is free of water, oil, or any other material detrimental to the Coating System. Provide adequate separators and traps and test air cleanliness daily according to ASTM D4285, or as directed. Regardless of the application method used to apply the Coating, use brushes to push the Coating into complex details, crevices, gaps, areas difficult to access, and where spraying does not adequately cover or penetrate. Conform all application techniques to Section 7 in SSPC-PA 1 and the applicable sections of SSPC Paint Application Guide No. 11.

00594.43(d)(1) Number of Coats and Film Thickness - Replace the paragraph that begins "The dry film ..." with the following paragraph:

Ensure the dry film thickness of the primer on steel-to-steel contact surfaces is not less than 3 mils nor more than the manufacturer's class "B" certification allows.

00594.43(d)(2) Stripe Coats - Replace the paragraph that begins "Apply a prime stripe Coat ..." with the following paragraph:

Apply a prime stripe Coat by brush after applying the full brush augmented prime Coat and apply an intermediate stripe Coat by brush before applying the full intermediate Coat. For two Coat Paint systems, except non-ferrous Coating Systems from the QPL, apply a top Coat stripe Coat prior to full top Coat application. Apply the stripe Coat by brush only. Use brushes to push the Coating around and into complex details and irregular surfaces identified as usually stripe coated by SSPC Paint Application Guide No. 11. Make each stripe Coat a

different color than the preceding and subsequent full Coat, extending a minimum of 1 inch from the irregular surface, and completely hiding the Substrate. Furnish a different color for the stripe Coat. Coat the stripe coat approximately 3 mils thick. Each stripe Coat has its own Hold Point and is not be used to correct deficiencies in the preceding or subsequent Coats. Apply stripe Coats according to the applicable sections of SSPC Paint Application Guide No. 11 that do not conflict with this Section or the Special Provisions.

00594.43(d)(3) Coating Thickness and Coverage Requirements - Replace this subsection, except for the subsection number and title, with the following:

The Engineer will take dry Coating thickness measurements after the application of each Coat and before application of the succeeding Coat. In addition to Coating thickness measurements, a visual inspection for complete coverage is made by the Engineer after each Coat. Apply each Coat in sufficient thickness to achieve uniform and complete coverage and appearance. If all thickness measurements are not within the specified minimum dry film thickness, or if the visual inspection does not satisfy the Engineer, make additional applications, as necessary, to meet the thickness and coverage required. Film thickness is measured above the peaks of the profile of the anchor pattern in the metal Substrate.

The Engineer will take dry film thickness measurements with a type 2 gauge according to SSPC-PA 2. Furnish a minimum dry film thickness measurements and frequency of measurements according to SSPC-PA 2, modified as follows:

Take a single gauge reading for each 10 square feet of surface area.

A spot measurement is only taken at locations where a gauge reading is less than 100 percent of the Project's specified minimum DFT.

Meet 100 percent of the Project's specified minimum DFT for all spot measurements. Additional readings may be required to identify the limits of the non-compliant areas.

If a question arises about an individual Coat thickness or coverage, it will be verified using a Tooke gauge, according to ASTM D4138. If the Tooke gauge shows a prime Coat to be less than the specified minimum thickness, or reveals a missing intermediate Coat, the total Coating System is rejected even if the thickness of the total system equals or exceeds total specified thickness.

In areas where dry film thickness measurements are impracticable, Wet Film Thickness measurements are made according to ASTM D4414.

00594.43(h) Environmental Conditions - Replace the paragraph that begins "If a Coating System allows ..." with the following paragraph:

If a Coating System allows application in environmental conditions different from those specified, submit a letter from the manufacturer stating the conditions that the Coatings can be applied. Application under conditions other than specified is not allowed without the Engineer's written approval.

00594.43(i) Stenciling - Replace this subsection, except for the subsection number and title, with the following:

Stencil the month and year of application and the type of Coating used in block letters 2 inches high at a location on each end of each span on the Structure being coated.

The exact location of stenciling is determined by the Engineer. Use flat black color stenciling unless otherwise directed.

00594.45(c) Handling, Shipping, or Surface Damage - Replace the paragraph that begins "Repair marred or damaged ..." with the following paragraph:

Repair marred or damaged coated surfaces according to 00594.60 at no additional cost to the Agency.

00594.45(d) Other Damage - Replace the bullet that begins "Abrasive material or ..." with the following bullet:

- Abrasive material or debris falling into an area that would create a traffic hazard.

(Use the following subsection .75 when a coating system warranty and supplemental warranty performance bond are required. Fill in the first blank with the structure number. Fill in the second blank with a discount to the value of the completed coating system work. The value of the coating system work shall include the value of all pay items listed in subsection 00594.90, subsection 00253.90, barges, and any additional painting work, based on the project cost estimate. Contact the Structure Coatings Engineer for the specific discount for the project. Be sure to include SP00084 when a coating system warranty is required.)

00594.75 Coating System Warranty and Supplemental Warranty Performance Bond - Add the following paragraph to the end of this subsection:

Provide a coating system warranty for Structure No. _____ and a supplemental warranty Performance Bond in the sum of \$ _____ to the Project Manager.

00594.75(a) Coating System Warranty - Replace the paragraph that begins "Unconditionally warrant to ..." with the following paragraph:

Unconditionally warrant to the Agency that all Coating Work and the Coating Systems, above deck and below deck, performed and applied on this Project are and shall be free of all defects for a period of 36 months. Provide a written 36-month warranty using the Agency-supplied Coating System warranty form that is included near the front of the Special Provisions booklet. Provide the written warranty 30 Calendar Days before the precoating conference. "Unconditionally warrant" means that the warranty covers all defects, regardless of the source or cause of the defect, including, without limitation, whether the source or cause is or may be related to workmanship, inspection, or choice of materials.

Replace the paragraph that begins "The 36-month Coating System ..." with the following paragraph:

The 36-month Coating System warranty will begin on the date of Second Notification. During this warranty period, the Agency will inspect the Coating System for defects three times; at approximately 12, 24, and 36 months after issuance of the Second Notification. The Contractor will be notified in advance of each inspection and is permitted to accompany the Agency Inspector. Make repairs and correct all defects to the Coating System. Make all corrections and repairs according to the Contract requirements.

00594.75(b) Supplemental Warranty Performance Bond - Replace the paragraph that begins "Provide a supplemental ..." with the following paragraph:

Provide a supplemental warranty Performance Bond, in addition to the regular Performance Bond for the Contract, executed by a Surety authorized to do business in the State of Oregon. Provide the supplemental warranty Performance Bond 30 Calendar Days before the precoating conference. The supplemental warranty Performance Bond dollar amount is listed above.

(Use the following subsection .90(a) when coating new metal structures and payment for the coating will not be made under Section 00594.)

00594.90(a) New Metal Structures - Replace this subsection, except for the subsection number and title, with the following:

No separate payment will be made for preparing and coating new metal Work. Payment for this Work, including correction of damages, will be included in payment made for appropriate items under which this Work is required.

00594.90 Payment - Replace the paragraph that begins "Payment will be payment ..." with the following paragraph:

Payment will be payment in full for furnishing and placing all Materials, and for providing all Equipment, labor, and Incidentals necessary to complete the Work as specified.