



Oregon

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DATE: February 28, 2006

Addenda No. 2

TO: PLAN HOLDERS

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SUBJECT: US:20 Yaquina River Bridge Painting Section
Corvallis - Newport Highway
Lincoln County
Structure & Painting Project
(Bids to be opened and read March 9, 2006)

The following changes are made to the Project Special Provisions:

1. Subsection **00170.70 Insurance** - This subsection is replaced with the following subsection:

| Insurance Coverages | Combined Single Limit per Occurrence | Annual Aggregate Limit |
|---|--------------------------------------|------------------------|
| Commercial General Liability | \$1,000,000 | \$2,000,000 |
| Pollution Liability | \$2,000,000 | \$5,000,000 |
| Lead Liability | n/a | n/a |
| Commercial Automobile Liability | \$1,000,000 | n/a |
| Commercial Automobile Liability with Pollution Coverage | \$2,000,000 | n/a |

2. Subsection **00290.30(a-1) Minimum Required Measures** - The 12th bulleted item that begins with the words "Locate areas for non-workshift ..." is replaced with the following:

- Locate areas for non-workshift storage of equipment and vehicles, other than track-mounted vehicles, at least 150 feet away from the Regulated Work Area, unless approved by the Engineer.

The 13th bulleted item that begins with the words "Locate areas for storing ..." is replaced with the following:

- Locate areas for storing fuels and other potentially hazardous materials and areas for refueling and servicing equipment and vehicles at least 300 feet away from the Regulated Work Area, unless approved by the Engineer.

Add the following bulleted items:

- All equipment, materials and personnel shall remain a minimum of 30' from the centerline of the Railroad unless approved by the Railroad and the Engineer.
- The southwest quadrant is not approved for staging. After approval of a staging area by the engineer, submit to the Engineer a "staging protection plan" detailing spill prevention and a spill contingency plan.

3. Subsection **00294A.01 Responsibilities** - The third paragraph that begins with the words "Provide proof of specific...." is deleted.

4. Subsection **00593.10 Coating Materials**: - In the first bulleted item replace "00593.10(e)" with:

00593.10(f).

5. Subsection **00593.40 (a) Existing Timber Structures (1)** - The fourth sentence that begins with the words " Rinse thoroughly with..." is replaced with the following:

Rinse thoroughly with clean water.

6. Subsection **00593.41(d)(1) Number of Coats and Film Thickness** - In the first line of the table, replace "Primer: 4 mils wet, 1.4 mils dry" with:

Primer: 4 mils wet, 2.3 mils dry"

7. Subsection **00593.80 New and Existing Steel Structures** - This subsection is replaced with the following subsection:

00593.80 New and Existing Timber Structures - No separate measurement will be made for work done under this Section.

8. Subsection **00593.90 General:** - Replace the paragraph header "**(a) Existing Timber Structures**" with the following header:

(a) New and Existing Timber Structures

9. The following Section header and paragraph are added after Subsection 0589.90:

SECTION 00593 – PREPARING AND COATING TIMBER STRUCTURES

Section 00593, which is not a Standard Specification, is included in this Project by Special Provision.

10. **SECTION 00594 - PREPARING AND COATING STEEL STRUCTURES** - This Section is replaced with revised **SECTION 00594 - PREPARING AND COATING STEEL STRUCTURES**. See attachment for full text.

These changes will be included in the Contract for this Project. It is understood that your Bid will be submitted accordingly.

ST:st

Attachments: Replaced Special Provisions Section

SECTION 00594 - PREPARING AND COATING STEEL STRUCTURES

Replace Section 00594 of the Standard Specifications with the following:

Description

00594.00 Scope - This work consists of preparing and coating Bridge No. 00683, a steel structure constructed in 1923 according to drawings 01824 & 01835 and modified in 1936 and 1962 as shown on drawings 72402 & 72517. There is lead and zinc chromate in the existing bridge coating. It should be assumed that mill scale exists under all of the existing coating.

This work includes all:

- Interior and exterior steel surfaces, including back side of end floor beams and floor beam surfaces covered by timber sidewalk brackets
- Steel bridge rails, bearings, and expansion assemblies
- Bridge drains

This work does not include:

- Steel "H" pile substructure for bridge approaches
- Concrete bridge approach spans
- "W" section guardrail (bridge approaches)

00594.01 Abbreviations, Definitions and References:

(a) Abbreviations:

AAMA - American Architectural Manufacturers Association

FTMS - Federal Test Method Standard

SSPC - Society for Protective Coatings

(b) Definitions:

Application - Method of applying a coating to the substrate.

Apparent Magnetic Surface - The magnetic surface that a magnetic gage senses, somewhere between the peaks and valleys of the profile, after the steel is roughened as by abrasive cleaning.

Cleaning - Removing detrimental material in preparation for coating.

Coat - Apply paint or other protective material to a substrate to form a single, uniform layer. A coat is comprised of as many applications as necessary to achieve the specified coat thickness.

Coating - Protective material after it is applied to a structure.

Coating Material - Protective material in the liquid state before application.

Coating System - All specified coats applied separately in a predetermined order.

Field Coating - Coating new or existing steel structures at the Project Site after erection.

Hold Point - A time at which the Contractor must cease 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.

Maintenance Coating - The coating of existing steel structures that have been previously coated and need recoating.

Manufacturer's Recommendation - The written specifications and instructions provided by a manufacturer of a coating material concerning the handling, mixing and application of the coating material.

Paint - A pigmented liquid, applied as a thin layer, which 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.

Phase - An activity or step of the preparation and coating procedures to be inspected or tested. The transition from one phase to another represents a hold point.

Preparation - Measures taken to provide a suitable surface ready to coat.

Shop Coating - The coating of steel surfaces in the fabrication shop before the steel is transported to the erection site.

Skimming - The process in which a film forms over a liquid coating, either during storage or after application.

Solvent - Liquid used to solvate or put materials into solution.

Stripe Coat - Separate coat of material applied to areas prone to premature failure, such as riveted or bolted connections and edges. This coat may involve any combination of the prime, intermediate, or topcoat depending on the requirements found in the Special Provisions. The stripe coat is an independent coat and shall be a hold point, having to be inspected prior to application of the subsequent coat. Each stripe coat is a different color than both the preceding and following coat.

Substrate - Any surface to which a coating is to be applied. This may be the prepared surface of the steel structure or a previous coating.

Surface Profile - Roughness of a cleaned steel surface. The height of the profile is measured from the bottom of the valleys to the top of the peaks in mils.

Thinner - Volatile liquids used to thin compatible coating materials. Thinners may be a blend of solvents.

(c) References - In this Section, references such as SSPC-SP 1 and SSPC-PA 1 refer to Volume 2, "Systems and Specifications", of SSPC's "Painting Manual". SSPC-Vis 1 refers to SSPC's "Visual Standards For Abrasive Blast Cleaned Steel".

In these Specifications, references are made to FTMS 141, "Paint, Varnish, Lacquers, and Related Materials: Methods of Inspection, Sampling and Testing", which is distributed by the U.S. General Services Administration. References include but are not limited to:

Society for Protective Coatings

| | |
|----------------------|---|
| SSPC-PA1 | Shop, Field & Maintenance Painting |
| SSPC-PA2 | Measurement of Dry Paint Thickness with Magnetic Gages |
| SSPC-Vis 1 | Guide and Reference Photos for Abrasive Blast Cleaned Steel |
| SSPC-Vis 3 | Guide and Reference Photos for Hand and Power Tool Cleaned Steel |
| SSPC-Vis 5 | Guide and Reference Photos for Wet Abrasive Blast Cleaned Steel |
| SSPC-Guide 6 | Guide for Containing Debris Generated During Paint Removal Operations |
| SSPC-Guide 7 | Guide for Disposal of Lead-Contaminated Surface Preparation Debris |
| SSPC-SP1 | Solvent Cleaning |
| SSPC-SP2 | Hand Tool Cleaning |
| SSPC-SP3 | Power Tool Cleaning |
| SSPC-SP6/NACE No. 3 | Commercial Blast Cleaning |
| SSPC-SP10/NACE No. 2 | Near White Blast Cleaning |
| SSPC-SP12/NACE No. 5 | Water Jet Cleaning |
| SSPC-SP14/NACE No. 8 | Industrial Blast Cleaning |
| SSPC-SP15 | Commercial Grade Power Tool Cleaning |

American Society for Testing Materials

| | |
|-------------|---|
| ASTM D 1475 | Density of Liquid Coatings, Inks, and Related Products |
| ASTM D 4138 | Dry Film Thickness of Protective Coating Systems |
| ASTM D 4285 | Oil or Water in Compressed Air |
| ASTM D 4414 | Wet Film Thickness |
| ASTM D 4417 | Surface Profile of Blast Cleaned Steel |
| ASTM D 4541 | Pull-off Strength of Coatings |
| ASTM D 4940 | Water-Soluble Ionic Contamination of Blasting Abrasives |
| ASTM D 5532 | Micaceous Iron Oxides for Paint |
| ASTM E 337 | Measuring Humidity with a Psychrometer |

Code of Federal Regulations

| | |
|-----------------------|--|
| 29 CFR Part 1910.16 | Rules of Construction |
| 29 CFR Part 1910.20 | Access to Employee Exposure and Medical Records |
| 29 CFR Part 1910.120 | Hazardous Waste Operations and Emergency Response |
| 29 CFR Part 1910.141 | Sanitation |
| 29 CFR Part 1910.1025 | Lead |
| 29 CFR Part 1926.16 | Rules of Construction |
| 29 CFR Part 1926.20 | General Safety and Health Provisions |
| 29 CFR Part 1926.21 | Safety Training |
| 29 CFR Part 1926.28 | Personal Protective Equipment |
| 29 CFR Part 1926.32 | Competent Person |
| 29 CFR Part 1926.51 | Sanitation |
| 29 CFR Part 1926.55 | Gases, Vapors, Fumes, Dusts and Mists |
| 29 CFR Part 1926.57 | Ventilation |
| 29 CFR Part 1926.59 | Hazard Communication |
| 29 CFR Part 1926.62 | Lead |
| 29 CFR Part 1926.103 | Respiratory Protection |
| 29 CFR Part 1926.200 | Accident Prevention Signs and Tags |
| 29 CFR Part 1926.353 | Ventilation and Protection in Welding, Cutting and Heating |
| 29 CFR Part 1926.354 | Welding, Cutting and Heating in Way of Preservative Coatings |

Oregon Administrative Rules (OAR)

| | |
|--------------------------------|--------------------------------|
| OAR 340 Division 101-108 | Hazardous Waste Regulations |
| OAR 340 Division 021-0050 | Fugitive Emissions Regulations |
| OAR 437 Division 2 – 1910.1025 | Oregon OSHA General Industry |
| OAR 437 Division 3 – 1926.62 | Oregon OSHA Construction |

United States Department of Labor, Material Safety Data Sheets (MSDS)

00594.02 Location of Work:

(a) Existing Steel Structures - Prepare and coat the following surfaces:

- All structural steel contained in the 80 foot truss span.
- All structural and miscellaneous steel contained in the traffic rail, bearings, expansion assemblies, and bridge drains of the 80 foot truss span.
- All existing steel surfaces damaged during Contractor operations.
- All existing steel surfaces uncovered by the removal of existing structural and miscellaneous steel and concrete members, and areas where rivets or bolts are removed.

- All new steel members, all required preparation and coating of new steel members shall take place at the fabrication shop after completion of fabrication and before transporting to the project site except as provided in these Special Provisions.
- Floor beam surface behind timber sidewalk brackets shall be prepared and coated. Use "Sidewalk Temporary Support Detail" in plans to support sidewalk and allow removal and replacement of timber sidewalk brackets.

Do not coat the following:

- Steel "H" pile substructure for bridge approaches.
- Concrete bridge approach spans.
- "W" section guardrail on bridge approaches.
- 1" diameter conduit for railroad crossing advance warning, on westerly side of bridge attached to concrete curb/deck.
- Concrete deck, curb, and pier surfaces.

(b) Non-Steel Metallic Substrates - Prepare and coat new non-steel substrates and features erected as part of the Project. All required preparation and coating shall take place at the fabrication shop after completion of fabrication and before transporting to the Project Site, except as provided in these Specifications.

00594.03 Precoating Conference - Before beginning work, the Contractor's supervisory personnel, together with any subcontractors and their supervisory personnel who are to be involved in the preparation and coating work, shall meet with the Engineer for a precoating conference at a time mutually agreed upon. Ten workdays before the precoating conference, submit a plan that identifies the methods of operation to accomplish all phases of the work, including but not limited to the following:

- Personnel qualifications and training
- Surface preparation
- Coating materials
- Coating application
- Quality control inspections
- Containment and waste management

Submittals

The Contractor shall submit the following 10 days prior to the precoating conference:

A. Surface Preparation and Painting Plan

1. Provide written procedures for conducting the Work of this Section including, but not limited to, the preparation of surfaces; coating mixing, application method, and repair; recoat times and cleaning between coats; and the installation of sealant materials in those areas specified. Provide specific details for the preparation and painting of limited access areas, and for striping edges, corners, crevices, rivets, bolts, nuts, welds and sharp edges.
2. Provide a comprehensive listing of the equipment that will be used for surface preparation and painting. Include a description of equipment repair and replacement capability, including the procedures that will be followed in the event of equipment failure so that lost production time is kept to a minimum. All equipment, materials, and vehicles brought to the site by the Contractor shall be clean and free of debris, including possibly hazardous material. A visual assessment of cleanliness shall be made by the Engineer prior to locating equipment at the contract site.

3. If temporary heating or lighting units are used, submit evidence of heating and lighting unit test acceptance by UL, FM or other recognized association and information related to the type of fuel used by the heating units in such tests and to be used in Work of this Section. In addition, all heating and lighting must meet all State fire codes.
4. Identify the class of containment system, methods of protection, and work isolation procedures that will be followed to protect the surrounding environment, structures, equipment, and property from exposure to surface preparation and paint overspray or debris.
5. Identify the name and chemical composition of any detergents or solutions that will be used if it is necessary to clean the surface of one coat prior to the application of the next. Only detergents which are environmentally safe and which will have no adverse effect on aquatic life are acceptable. Submit the MSDS sheets for the chemicals and detergents.
6. Identify the type and brand name of the abrasives and additives proposed for use. Provide MSDS sheets for all abrasives and additives.
7. Provide a written plan for rendering the waste material resulting from the paint removal operations non-hazardous and/or for minimizing the amount of waste generated, adhering to the options allowed for coating removal. Provide a written plan describing temporary storage measures. Provide a complete description of how and where the material is to be recycled. In addition, provide an "Emergency Contingency Plan" for any waste escapes or spills as per the large quantity generator requirements.

B. Rust Inhibitor (if a rust inhibitor is proposed)

1. Provide the name, generic type, and MSDS for the proposed rust inhibitor.
2. Provide written application instructions from the manufacturer.
3. Provide a letter from rust inhibitor manufacturer stating that the material is compatible with the paint system.
4. Provide a letter from coating manufacturer stating that the material is compatible with the paint system.

C. Coating Materials

1. Identify the coating materials to be applied to all substrate types as specified in 00594.11 "Coating Materials". If it is proposed that materials or products other than those specified be used, submit product information in accordance with the requirements of this specification.
 - a) Confirm that all coating materials will be produced by the same manufacturer.
 - b) Provide the manufacturer's name, product names, product numbers, material product data sheets, VOC levels, and MSDS sheets.
 - c) Provide the following composition ranges for each coat:
 - Viscosity (Stormer @ 77° F) Ku, ASTM D 562
 - % Total Solids by Weight, ASTM D 2369
 - Volatile Organic Compounds (VOC), ASTM D 2369
 - Weight per Gallon, ASTM D 1475
 - Volume Nonvolatile Matter, ASTM D 2697
 - Pigment Content, ASTM D 2371
 - % Metallic Zinc in Primer, ASTM D 521
 - Type and quantity of micaceous iron oxide in the intermediate coat.

2. Provide written application instructions from the manufacturer:
 - a) Fully describe mixing and pot life requirements, specified thinners and thinner amounts, recommended application equipment, coating dry film thickness, and recoat times as a function of surface and air temperature.
3. Provide the following coating material certifications:
 - a) Moisture cured urethane coating system meets the specifications of 00594.11(e).
 - b) Coating materials meet the specifications on the manufacturer's data sheets.
 - c) The coating materials in the coating system are compatible.
 - d) Coatings to be used do not contain lead or other hazardous heavy metals.
 - e) The manufacturer has manufactured all coatings of the systems to be used on this project.

D. Sealant Materials

1. Provide the name, generic type, and MSDS for the proposed sealant.
2. Include a letter from the coating manufacturer stating acceptance of the sealant material for use with the coating system.
3. Provide letters from the sealant manufacturers stating that the materials are suitable for the intended use.
4. Provide written application instructions from the sealant manufacturers. Include the type of equipment needed for application, mixing and application procedures, temperature and weather restrictions for application and curing, thickness requirements, and drying times for overcoating or exposure to weather.

E. Quality Control Inspection Plan - Submit a quality control inspection plan that will be followed to confirm that all Work complies with the requirements of this Section.

The plan must include the following at a minimum:

1. Inspection organization chart including lines of authority and the experience, training, and qualifications of all quality control personnel.
2. Written inspection procedures for all phases of the Work, including the frequency of inspections that will be performed, and the procedures for correcting non-conforming work.
3. Written description of equipment to be used for surface preparation and coating application inspection, calibration procedures, frequency of calibration, and the methods for handling equipment that is found to be out of calibration.
4. The Contractor shall maintain a daily log of all quality control inspections and test results in compliance with the approved Quality Control Inspection Plan. A copy of the daily logs shall be submitted to the Engineer each week.

F. Qualifications - Provide evidence of the following:

1. Workers/Supervisors - Confirm that all workers and supervisors hold valid certification of completion of 29 CFR 1926.22 lead in construction training as required by special provisions 0291.00 and 00291.01.

00594.04 Notice - Notify the Engineer, in writing, at least one week in advance of the date that preparation and coating operations are to begin.

00594.05 Containment - Contain work debris that is generated from dry blast cleaning operations according to the Class 1A requirements of SSPC-Guide 6, with the following revisions:

- Containment material (A1 rigid in locations adjacent to traffic)
(A2 flexible in locations not adjacent to traffic)
- Air makeup (F1 controlled)
- Input air flow (G1 forced)
- Air pressure (H2 visual)
- Air movement (I1 minimum specified)

Contain work debris that is generated from water jet cleaning operations according to the Class 2W requirements of SSPC-Guide 6, with the following revisions:

- Containment material (A1 rigid in locations adjacent to traffic)
(A2 flexible in locations not adjacent to traffic)
- Ceiling not required
- Wall height shall effectively prevent loss of contaminated water

Maintain the traffic clearances indicated in the plans. The containment and cables, hoses, supplies and equipment must not encroach on the indicated traffic clearances at any time.

The containment structure shall be designed to remain in place and not exceed the allowable stress limits of its materials and the structural members of the bridge while supporting all personnel, equipment, and materials, including collected blasting debris, required for normal operations and while exposed to a basic wind speed of 40 mph. Containment structure specifications, shop drawings, welding procedures, and design calculations assuring that the containment system and the structural members of the bridge can safely resist the combined effects of dead loads, live loads, and wind loads shall be submitted to the Engineer for review within 30 days of the award of the contract. The design submittals shall be prepared and stamped by a qualified engineer licensed to practice in the State of Oregon.

For all structures over water the Contractor shall provide containment means to prevent debris from falling in or collecting on the surface of the water. If contamination occurs the Contractor shall contain and remove fallout material. A boom up and down the river or waterway shall be used, if feasible, to contain and collect the contaminating material, preventing its spread. Some method of removing the collected, floating debris, such as skimmers, is required. The Contractor shall identify the type and placement of water booms, methods of anchoring, and procedures of removing debris in the event such booms are required.

If at any time during the life of the project, the containment system fails to function at the required level of efficiency, the Contractor shall be required to suspend all operations except those that are attendant to minimizing the adverse effect to the environment. Work shall not resume until the containment system again meets the required level of efficiency.

Maintain the traffic clearances indicated in the plans. The containment and cables, hoses, supplies and equipment must not encroach on the indicated traffic clearances at any time.

00594.06 Lead and Zinc Chromate Paint - The existing coating includes a red lead and zinc chromate system, which is considered a hazardous material. The Contractor shall contain, recover, and properly dispose of all waste, including hazardous waste, generated during surface preparation, coating operations, and all other associated work on the structures. No spent abrasive, removed coating, or applied coating shall be allowed to contaminate the environment. Contain and collect waste material in an approved area in the same manner as if it were a hazardous material. All on-site temporary storage, handling, and labeling shall be in accordance with 40 CFR 262 and 40 CFR 265. Prevent the escape of dust or paint, which may create a nuisance or hazard in the vicinity of the structure. At no time shall any debris be allowed to fall into the water or on the surrounding ground in the vicinity of the Project. Standard Specification Section 00290 and Special Provisions to the Standard Specifications for this project, SP 00291 and SP 00294A cover the Contractor's responsibilities for protecting the public health and environment, and worker safety.

Materials

00594.10 General - Use materials meeting the requirements of this Section, the Special Provisions, and the applicable portions of SSPC-PA 1, "Shop, Field and Maintenance Painting", when not in conflict with either this Section or the Special Provisions.

00594.11 Coating Materials:

(a) General - Steel coating materials shall be from the same manufacturer and shall be compatible with one another. Before notice required by 00594.04, submit a manufacturer's certification stating that:

- The coating materials meet the requirements of 00594.11(e).
- The coating materials in the coating system are compatible.
- The same manufacturer has produced all coats of the coating materials in the coating system specified and furnished for the Project.
- The coating materials meet the specifications on the manufacturer's data sheets.

Application of coating materials will not be allowed until certifications have been provided and the materials are accepted for use by check testing by the Agency.

(b) Manufacturing - The coating material shall:

- Be prepared at the factory ready for application or mixing of multi-component coatings. Multi-component coating materials shall be proportioned by the manufacturer with each component in its correct proportion and furnished in separate containers ready for field mixing. No field mixing will be allowed for moisture-cured urethane coating system components unless approved by the Engineer.
- Be homogeneous, free of contamination, and of a consistency suitable for the specified use.
- Include additives for control of sagging, pigment settling, leveling, drying, dryer absorption, skimming, and other qualities and properties that affect its application and curing.
- Not require a pretreatment chemical or material prior to application of the prime coat except as stipulated in these Specifications.
- Include required tinting and coloring materials at the time of manufacture. When successive coats are specified, each coat of the system shall be of a different color to provide contrast between coats and the substrate. The tinting material shall be compatible with the coating material and not detrimental to performance.
- For top coating material color, closely conform to Federal Standard 595b color #17038 (gloss black), unless otherwise specified. Color chips for specified top coating material colors are available from the Agency's Material and Research Section. Coat a 1 m² (1 square yard) test panel on the bridge according to Specifications. Do not order full-scale manufacture of the top coat until the Engineer has approved the resulting color.
- Not vary in composition without prior notice by the manufacturer and approval of the Engineer.
- No reformulation will be allowed.
- Be applied within 12 months of date of manufacture.

(c) Packaging - Each container shall:

- Be new steel or plastic of not more than 23 L (6 gallon) capacity.
- Have a lug-type crimp lid with a ring seal and shall be equipped with ears and bails.

- Meet U.S. Department of Transportation’s Hazardous Material Shipping Regulations.
- Be lined, if necessary, to prevent attack by the coating material. The lining shall not delaminate from the container wall so as to contaminate the coating.
- Be labeled with a quality compliance certificate according to 00165.35, showing the following:
 - Manufacturer’s name
 - Exact title of coating material
 - Agency Specification number, if any
 - Manufacturer’s batch number
 - Date of manufacturer
 - Identification of all toxic substances
 - Handling and application precautions

(d) Sampling and Testing - Have the coating material manufacturer furnish the following to the Agency’s Materials and Research Section:

- Two unopened 1 quart containers of each coating material, each component of multi-component coating material, and each thinner, from each batch of each coat, sampled at the factory at the time of containerizing. The Agency may, at its discretion, place an inspector at the site of manufacture and/or obtain check samples at the jobsite.
- Test results certification according to 00165.35 for each batch of each coat, and if the coating material is specified for use on steel-to-steel contact surfaces, certification that the coating material meets the requirements of 00594.11(e).
- A product data sheet for each type of coating material and thinner.
- A material safety data sheet with the initial sample of each type of coating material and thinner.

Agency testing will include those of the following tests necessary to insure that the coating materials conform to Specifications, and such other testing as the Agency deems appropriate.

Test

Test Method

| | |
|--|-----------------------|
| Density of Liquid Coatings, Inks, and Related Products | ASTM D 1475 |
| Determination of Zinc in Dry Films of Paints and Coatings | ODOT TM 614 |
| Coarse Particles in Pigments, Pastes, and Paints | ASTM D 185 |
| Consistency of Paints Using the Stormer Viscometer | ASTM D 562 |
| Fineness of Dispersion of Pigment-Vehicle System | ASTM D 1210 |
| Drying, Curing, or Film Formation of Organic Coatings at Room Temperatures | ASTM D 1640 |
| Volatile Content of Paints | ASTM D 2369 |
| Pigment Content of Solvent-type Paints | ASTM D 2371 |
| Volume Nonvolatile Matter in Clear or Pigmented Coatings | ASTM D 2697 |
| Vehicle Solids (Ordinary Centrifuge) | FTMS 141, Method 4051 |
| Nonvolatile vehicle Content | FTMS 141, Method 4053 |

Agency testing is not to be construed as determining or predicting the performance or compatibility of the individual coating material or the total coating system.

(e) Specifications - The coating system for all steel surfaces to be painted on the Project shall incorporate the systems outlined in the following subsections by the type of application. The various coats of paint shall be applied in the thicknesses specified in 00594.42(d-1).

The coatings on steel-to-steel contact surfaces at all slip-critical structural bolted connections using high strength bolts in primary members shall meet Class B (slip coefficient of 0.5) coating requirements according to "Test Method to Determine the Slip Coefficient for Coatings Used in Bolted Joints", as adopted by the Research Council on Structural Connections.

(1) Coating New Steel:

a. Primer

Generic Type: Zinc-filled, single-component, moisture-cured polyurethane
Vehicle Type: Moisture-cured polyurethane
Pigment Type: Zinc dust
Pigment Content: 80% minimum zinc by mass (weight) in dry film
VOC: 2.8 lb/gal maximum
Volume solids: 59% minimum

b. Intermediate Coat

Generic Type: Micaceous iron oxide-filled, single-component, moisture-cured polyurethane
Vehicle Type: Moisture-cured polyurethane
Volume Solids: 59% minimum
Pigment: A minimum of 2.9 lb/gal of micaceous iron oxide
VOC: 2.8 lb/gal maximum
Color: Tinted to distinguish from primer and top coat

c. Topcoat

Generic Type: Single-component, moisture-cured, aliphatic polyurethane
Vehicle Type: Moisture-cured, aliphatic polyurethane
Volume Solids: 60% minimum
Finish: Gloss
VOC: 2.8 lb/gal maximum
Color: Federal Standard 595b Color No. 17038 (gloss black)

All micaceous iron oxide utilized in the coats shall conform to ASTM D 5532, Type 1. Provide manufacturer's certification of conformance.

(2) Recoating "Near White" (SP10) Cleaned Steel:

a. Primer

Generic Type: Zinc-filled, single-component, moisture-cured polyurethane
Vehicle Type: Moisture-cured polyurethane
Pigment Type: Zinc dust
Pigment Content: 80% minimum zinc by weight in dry film
VOC: 2.8 lb/gal maximum
Volume Solids: 59% minimum

b. Intermediate Coat

Generic Type: Micaceous iron oxide-filled, single-component, moisture-cured, polyurethane
Vehicle Type: Moisture-cured, polyurethane
Volume Solids: 59% minimum
Pigment: A minimum of 2.9 lb/gal of micaceous iron oxide
VOC: 2.8 lb/gal maximum
Color: Tinted to distinguish from primer and top coat

c. Special Intermediate Coat [Locations Indicated on Plans]

Generic Type: Micaceous iron oxide-filled, single component, urethane-tar, moisture-curing urethane
Vehicle Type: Moisture-cured polyurethane
Volume Solids: 60% minimum
VOC: 2.8 lb/gal maximum
Color: Tinted to distinguish from primer and top coat

d. Topcoat

Generic Type: Single-component, moisture-cured, aliphatic polyurethane
Vehicle Type: Moisture-cured, aliphatic polyurethane
Volume Solids: 60% minimum
Finish: Gloss
VOC: 2.8 lb/gal maximum
Color: Federal Standard 595b Color No. 17038 (gloss black)

Approved suppliers are listed in "ODOT Qualified Products List for STRUCTURAL COATINGS" which is available at <http://egov.oregon.gov-ODOT-HWY-CONSTRUCTION-QPL-Docs-QPLStructuralCoating.pdf.url>.

All micaceous iron oxide utilized in the coats shall conform to ASTM D 5532, Type 1. Provide manufacturer's certification of conformance.

(3) Recoating "Non Near White" (SP14) Cleaned Steel:

(a) Primer - Primer must be capable of penetrating and adhering to poorly prepared surfaces.

Generic Type: Zinc and micaceous iron oxide-filled, single-component, moisture-cured polyurethane
Vehicle Type: Moisture-cured polyurethane.
Pigment Type: Zinc and micaceous iron oxide pigment
Pigment Content: 59% minimum zinc by mass (weight) in dry film
15% minimum micaceous iron oxide by mass (weight) in dry film
VOC: 2.8 lb/gal maximum
Volume solids: 59% minimum

(b) Intermediate Coat:

Generic Type: Micaceous iron oxide-filled, single-component, moisture-cured polyurethane
Vehicle Type: Moisture-cured polyurethane
Volume Solids: 59% minimum
Pigment: A minimum of 2.9 lb/gal of micaceous iron oxide
VOC: 2.8 lb/gal maximum
Color: Tinted to distinguish from primer and top coat

(c) Topcoat:

Generic Type: Single-component,moisture-cured, aliphatic polyurethane
Vehicle Type: Moisture curing, aliphatic polyurethane
Volume Solids: 60% minimum
Finish: Gloss
VOC: 2.8 lb/gal maximum
Color: Federal Standard 595b Color No. 17038 (gloss black)

All micaceous iron oxide utilized in the coats shall conform to ASTM D 5532, Type 1. Provide manufacturer's certification of conformance.

(4) Non-Steel Metallic Substrates:

(a) First Coat (Galvanized Surfaces)

Generic Type: Micaceous iron oxide-filled, single-component, moisture-cured, polyurethane
Vehicle Type: Moisture-cured, polyurethane
Volume Solids: 59% minimum
Pigment: A minimum of 2.9 lb/gal of micaceous iron oxide
VOC: 2.8 lb/gal maximum
Color: Tinted to distinguish from substrate and top coat

(b) Topcoat - Gloss Finish

Generic Type: Single-component, moisture-cure aliphatic polyurethane
Vehicle Type: Moisture-cured aliphatic polyurethane
Volume Solids: 60 % minimum
VOC Content: 2.8 lb/gal maximum
Finish: Gloss
Color: As specified

All micaceous iron oxide utilized in the coats shall conform to ASTM D 5532, Type 1. Provide manufacturer's certification of conformance.

00594.12 Sealant - Sealant called for in 00594.42(f) shall be an industrial grade polyurethane sealer approved for use by the coating manufacturer. The sealant color shall be clear or shall approximate the color of the coating, as the Contractor elects.

Backing material shall be industrial grade polystyrene or polyurethane of sufficient diameter to fill the crevices or gaps as required. Obtain the Engineer's approval of the sealant and backing material before using.

Construction

00594.40 Special Fabrication, Preparation and Coating:

(a) Inaccessible Surfaces - Before fabrication, prepare and coat with all coats steel surfaces inaccessible to preparation and coating after fabrication.

Prepare and coat contact surfaces within slip-critical joints, constructed as part of the work under Section 00560, according to 00594.41 and 00594.42(d-1).

(b) Welded Areas - Schedule fabrication, preparation and coating so that the coating system is not damaged by the welding or fabricating process.

Neutralize weld areas and remove smoke stain, slag, spatter and spalls by blast-cleaning. Supplement blast-cleaning by other treatment as recommended by the manufacturer of the coating system and as required in 00594.41.

Do not apply coatings within 4 inches of the weld before finishing the welding operation.

00594.41 Preparation of Surfaces:

(a) New Steel Structures - Clean new steel structure surfaces to be coated by either (1) dry blast cleaning according to SSPC-SP 10, "Near-White Blast Cleaning", or (2) ultra high pressure water jet blasting according to SSPC-WAB 10, "Wet Near-White Blast", except as modified by this Section. After completion of near-white blast cleaning, the appearance of the surface shall closely approximate Pictorial Standard SP 10 of SSPC-Vis 1. After completion of wet near-white blast, the appearance of the surface shall closely approximate Pictorial Standard SP 10 of SSPC-Vis 5.

(b) Existing Steel Structures - All steel surfaces to be coated shall have any oil, grease, or similar material removed by solvent cleaning prior to coating removal. In addition, heavy bird dropping deposits shall be removed, contained and properly disposed of prior to coating removal.

Clean existing steel structure surfaces to be coated by either (1) dry blast cleaning according to SSPC-SP 10 "Near White Blast", or (2) ultra high pressure water jet blast cleaning according to SSPC-WAB 10 "Wet Near-White Blast", except as modified by this Section.

If near white blast is used, the appearance of the cleaned surface shall closely approximate Pictorial Standard SP 10 of SSPC-Vis 1. No mill scale or paint will be allowed. Rust stains, paint stains or mill scale stains will be allowed, as per SSPC SP10. Portions of the end floor beams which are accessible only through 6" access openings shall be cleaned according to SSPC-SP 14 "Industrial Blast" except that Section 2.2 of SSPC-SP 14 is not applicable; the appearance of the cleaned surface shall closely approximate Pictorial Standard SP 14 of SSPC-Vis 1.

If wet near-white blast is used, the appearance of the cleaned surface shall closely approximate Pictorial Standard SP 10 of SSPC-Vis 5. No mill scale or paint will be allowed. Rust stains, paint stains or mill scale stains will be allowed, as per SSPC SP10. Portions of the end floor beams which are accessible only through 6" access openings shall be cleaned so that the appearance of the cleaned surface closely approximates Pictorial Standard SP 14 of SSPC-Vis 1.

(c) Non-Steel Metallic Substrates:

(1) New Galvanized Surfaces - New galvanized surfaces to be coated shall be solvent cleaned (SSPC-SP1) followed by either a light brush blast (SSPC-SP7) or surface etching with a 7%-10% hydrochloric acid solution, or a vinyl wash material (designed to prepare galvanized surfaces for coating application) to produce a slight abraded or etched appearance. Ensure that the surface is free of all debris or material resulting from the surface preparation procedures prior to painting. It is important that all oil, grease, or other contaminants be removed by the initial solvent cleaning prior to acid etching. If abrasive blasting is utilized, it shall be performed in a manner that properly removes contaminants but does not destroy the integrity of the galvanized surface. If vinyl wash is utilized, the material shall be compatible with the applied coating.

(2) Weathered Galvanized Surfaces - Existing weathered galvanized surfaces shall be lightly brush blasted (SSPC-SP7) with a light abrasive to remove loose, delaminating surface contaminants, corrosion, and other deleterious material. The abrasive blasting shall be performed in a manner that will properly clean the surface but not destroy the integrity of the galvanizing, and provide an adequate surface to which the coating system can adhere.

(d) All Steel Structures - Remove fins, tears, slivers and sharp edges, plus hardened or damaged edges resulting from flame cutting, shearing or similar operations, and grind all welds smooth. Grind back any knife edges created by corrosion to a minimum thickness of 1/8" inch.

(1) Cleaning Methods - Remove and dispose of the existing coating system according to one of the following:

(a) Abrasive blast the existing coating with a mineral slag combined with an approved additive to render the material non-hazardous. Obtain approval for the specific abrasive blast additive prior to use.

(b) Abrasive blast the existing coating utilizing a recyclable steel grit. Dispose of the waste at an approved hazardous waste recycle facility.

(c) High or ultra-high pressure water jet blast the existing coating. Obtain approval for specific abrasive additives prior to use. Dispose of the waste at an approved hazardous waste recycle facility.

Use methods specified in SSPC-SP 1, SSPC-SP 2, and SSPC-SP15 as necessary to augment cleaning.

Provide the Engineer a written description of the procedure and product to be used within 30 days of the award of the Contract. The recycling description shall enumerate how the material is to be recycled and the location of the facility where the process will take place.

(2) Surface Profile - Perform blast-cleaning or water jet blasting using materials, methods and equipment that will continually produce a surface profile of at least 1 mil, but not more than 4 mils, as measured by ASTM D4417 using replica tape on the prepared surface. The cleaning shall result in a roughened steel surface comparable to a Keane-Tator Surface Profile Comparator for sand or grit using ASTM D4417.

(3) Abrasives - Abrasives shall have no corrosion products, water, oil or any other material detrimental to the application and adherence of the coatings. Abrasive cleanliness will be tested according to ODOT TM 616 and ASTM D 4940. Wet abrasives are allowed if wet sandblasting methods or water jetting methods are used.

The conductivity of the abrasive shall not exceed 250 microSiemen when tested according to ASTM D4940.

(4) Air - The high-pressure air used for blast-cleaning or blowing down shall be free of water, oil or any other material detrimental to the coating system. Provide adequate separators and traps. Compressed air cleanliness will be tested according to ASTM D4285 by the engineer.

(5) Water – The water used for jetting shall be clean, drinking-quality water, free of contaminants.

(6) Rust Inhibitor - If a rust inhibitor is not used with wet sandblasting or water jetting, brush-blast any rust bloom on the surface before applying the coating. If an effective rust inhibitor is used, it shall not be detrimental to the coating system and shall be applied to the freshly cleaned surface or contained in the liquid used in cleaning. Use a rust inhibitor recommended by the coating manufacturer, or prepare a test panel at least 14 calendar days before beginning work to show that the rust inhibitor does not cause loss of bond between the prepared steel substrate and the primer. If bond failure occurs, no further use of the rust inhibitor will be allowed.

(7) Cleaning Procedures - Perform cleaning operations without damaging partially or entirely completed portions of the work. Do not blast-clean or water jet-clean adjacent to areas being coated.

The cleaned surface will be examined for any traces of corrosion, water, oil, grease, and other material deposited during the cleaning operations. If present, remove any detrimental material by solvent cleaning and re-blast or re-jet the surface.

(8) Final Preparation - Before coating, the prepared surface shall be:

- Blown down with high-pressure air, supplemented by brushing if required
- Free of all residue
- Acceptable to the Engineer

00594.42 Coating Metal Structures:

(a) Description - When not in conflict with this Section and the Special Provisions, perform coating application conforming to:

- The best practices of the trade
- The recommendations of the coating manufacturer
- The applicable portions of the SSPC-PA 1
- The applicable portions of the SSPC-PA2

(b) Application Site Mixing and Thinning of Coating Materials:

(1) Rejection - The container contents will be rejected, and shall not be used if:

- The material arrives at the application site in other than original, unopened containers.
- The container has a break in the lid seal or a puncture.
- The coating materials have begun to polymerize, solidify, gel or deteriorate in any other manner.
- The date of manufacture is more than 12 months past.
- A skin forms on the surface of the material or on the sides of the container and the volume of the skin exceeds 2% of the material. If there is not more than 2% skin, remove and discard only the skin.

(2) Mixing - Thoroughly mix coating materials by mechanical means to insure a uniform composition. Do not mix coating materials by means of air stream bubbling or boxing. Mix in the original container and continue until all pigment or metallic powder is in suspension. Take care to ensure that any solid coating material that may have settled to the bottom of the container is thoroughly dispersed. After mixing, inspect the coating materials for uniformity and to insure that no unmixed pigment or lumps are present.

Add separately packaged catalysts, curing agents, hardeners, initiators or dry metallic powders to the base coating material only after the base coating material is thoroughly mixed to achieve a uniform mixture with all particles wetted. Add the proper volume of curing agent to the correct volume of base with constant agitation. Use the mixture within the pot life specified by the manufacturer. Discard unused portions at the end of each workday.

(3) Thinning - Do not add additional thinner at the application site unless approved. The amount and type of thinner, if allowed, shall conform to the manufacturer's specifications.

(4) Straining - Strain all coating materials after mixing to remove undesirable matter, but not pigment or metallic powder.

(5) Agitation - Constantly agitate coating materials as recommended by the manufacturer, and all inorganic zinc primers during application, using paint pots equipped with mechanical agitators.

(c) Application of Coating:

(1) Surface Condition - Ensure that the surface to be coated is free of moisture, dust, grease, flash rust, or other substance which would prevent the bond of succeeding applications. Protect freshly coated surfaces from contamination by abrasives, dust or foreign materials from any source. Prepare contaminated surfaces to the Engineer's satisfaction before applying succeeding coats.

(2) Application Methods - 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. All application techniques shall conform to Section 7, SSPC-PA 1.

Apply each coat in a uniform layer, completely covering the preceding coat. Each individual coat shall be furnished by the manufacturer in a sufficiently different shade so that skips and holidays can be easily detected. Do not tint the coating material in the field unless approved. Correct runs, sags, skips or other deficiencies before application of succeeding coats. Such corrective work may require re-cleaning, application of additional coating, or other measures as directed, at no additional compensation.

(d) Coating Requirements:

(1) Number of Coats and Film Thickness - Apply coatings to the prepared surfaces as follows:

(a) New Steel Components:

| Coat | Formula | Minimum Dry Film Thickness |
|--------------|---|-----------------------------------|
| Prime | Zinc-filled single-component moisture-cured polyurethane | 3 mils |
| Intermediate | Micaceous iron oxide-filled single-component, moisturecuring polyurethane | 3 mils |
| Topcoat | Single-component, moisturecuring polyurethane | <u>2 mils</u> |
| | TOTAL | 8 mils |

(b) Recoating "Near White" (SP10) Cleaned Steel

| Coat | Formula | Minimum Dry Film Thickness |
|--|--|---|
| Stripe | Zinc-Filled single-component moisture-cured polyurethane | (3 mils) |
| Prime | Zinc-Filled single-component moisture-cured polyurethane | 3 mils |
| Stripe | Micaceous iron oxide-filled single component, moisture-curing polyurethane | (3 mils) |
| Intermediate | Micaceous iron oxide-filled single component, moisture-curing polyurethane | 3 mils |
| Special Intermediate [Locations Indicated on Plans] | Single component, urethane-tar, moisture-curing urethane | 6 mils |
| Topcoat | Single component, moisture-curing polyurethane | <u>2 mils</u> |
| TOTAL (Not Including Stripe Coats) | | 8 mils [11 mils special Intermediate coating areas] |

(c) Recoating "Non Near White" (SP14) Cleaned Steel

| Coat | Formula | Minimum Dry Film Thickness |
|------------------------------------|--|-----------------------------------|
| Stripe | Zinc and micaceous iron oxide-filled single-component, moisture-cured polyurethane | (3 mils) |
| Prime | Zinc and micaceous iron oxide-filled single-component, moisture-cured polyurethane | 3 mils |
| Stripe | Micaceous iron oxide-filled single-component, moisturecuring polyurethane | (3 mils) |
| Intermediate | Micaceous iron oxide-filled single-component, moisturecuring polyurethane | 3 mils |
| Topcoat | Single-component, moisturecuring polyurethane | <u>2 mils</u> |
| TOTAL (Not Including Stripe Coats) | | 8 mils |

(d) Galvanized Surfaces:

| Coat | Formula | Minimum Dry Film Thickness |
|-------------|--|-----------------------------------|
| Stripe Coat | Micaceous iron oxide-filled single-component, moisture-curing polyurethane | (3) mils |
| First Coat | Micaceous iron oxide-filled single-component, moisture-curing polyurethane | 3 mils |
| Topcoat | Single-component, aliphatic, moisture-curing polyurethane | <u>3 mils</u> |
| | TOTAL (Not including Stripe Coat) | 6 mils |

Apply the coating system in as many coats as specified, with each coat consisting of as many applications as necessary to cover the work and achieve the minimum thickness specified for the coat.

Apply only a coating of zinc primer to all steel-to-steel and steel-to-concrete contact surfaces, whether in the shop or field. The dry film thickness shall not be less than 3 mils nor more than 5 mils.

Do not assemble coated joints before the coatings have cured for at least the time used in the qualifying test, or as recommended by the manufacturer.

On steel-to-wood contact surfaces, apply all coatings specified.

Regardless of the primary method selected for applying any individual coat, use brushes to ensure proper coverage of each coat around structural irregularities. Brush the coating into:

- Gaps and crevices between steel members
- Back edges of steel members
- Lips around and back sides of rivets and bolts
- Connection areas to which access is difficult
- Areas where spraying does not adequately coat or penetrate crevices

(2) Stripe Coats - Precede the prime and intermediate coats by initial applications of stripe coats on all edges, corners, seams, crevices, interior angles, junctions of joining members, gaps and crevices between steel members, around rivet or bolt heads, nuts and threads, weld lines and similar surface irregularities. Apply each stripe coat separately and by brush only to ensure required coverage and penetration of all areas. Extend each stripe coat a minimum of one inch from the irregular surface. Each stripe coat shall be approximately 3 mils in thickness, and thick enough to completely cover and hide the substrate over which it is applied. Each stripe coat shall be independent of the full coat and include its own hold point. Each stripe coat shall be a different color than both the preceding and following coat. Do not proceed with application of the full coat prior to approval of the stripe coat. Do not use stripe coats to correct deficiencies in preceding or subsequent coats.

The full prime coat may be applied prior to the stripe coat to prevent flash rusting of the cleaned steel surfaces if approved by the Engineer, in which case the application of the full prime coat shall be accompanied by the use of brushes as described in the previous subsection.

(3) Coating Thickness and Coverage Requirements - Coating thickness measurements will be made by the Engineer 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 will be 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 will be measured above the peaks of the profile of the anchor pattern in the steel substrate. The dry film thickness for each stripe coat shall be approximately 3 mils, and thick enough to completely cover and hide the substrate.

The dry film thickness will be measured for acceptance using a magnetic gauge or magnetic flux gauge according to SSPC-PA2. In addition to the requirements of SSPC-PA2, a minimum of two spot measurements will be made on each truss member and each floor beam. The average of the three readings at each spot measurement shall meet the minimum dry film thickness specified in 00594.42(d). If a question arises about an individual coat thickness or coverage, it will be verified using a Tooke gauge, according to ASTM D 4138. 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 will be rejected even if the thickness of the total system equals or exceeds total specified thickness.

In areas where dry film thickness measurements are impractical, wet film thickness measurements will be made according to ASTM D 4414.

Each coat, whether a full, complete coat covering 100% of the steel surfaces, or a stripe coat utilized on the described areas subject to premature failure, shall be a separate entity meeting all specified thickness and coverage requirements. Do not use a preceding or succeeding coat to remedy deficiencies in any other coat. Each coat shall meet all applicable specifications, and shall completely cover the substrate to which it is applied.

(4) Additional Top Coat Requirements - Apply the top coat, regardless of the total thickness of prime and intermediate coats, in sufficient thickness to achieve uniform and complete coverage and appearance and to achieve the minimum required topcoat thickness. The final topcoat shall be of a uniform appearance.

(e) Time of Application - Prime existing steel structure surfaces on the same day they are cleaned by dry blast-cleaning methods, weather permitting. Surfaces cleaned by liquid blast-cleaning methods shall be thoroughly dry before priming. Apply prime coat before any visible indication of rust formation but within two work days of initial cleaning.

If weather does not permit priming the same day, up to two days of additional blasting will be permitted. If the three days of blast-cleaning occur near the end of the coating season, continue with the coating effort until all blast-cleaned surfaces have been coated with the complete coating system. If the delay is for any other reason, continue with the coating effort until all blast-cleaned surfaces have been coated with a prime coat.

Apply each coat over the preceding coat as soon as possible, allowing for drying time of the preceding coat, weather, temperature, and similar factors, as well as the manufacturer's recommendation.

Each coat shall be dry before recoating, and sufficiently cured so the succeeding or additional coat can be applied without delamination, blistering, wrinkling, or loss of adhesion or cohesion. Recoat times shall conform to the manufacturer's recommendations unless they conflict with this Section or any coating problems develop. Revision of recoat times requires approval of the Engineer prior to recoating.

When the Special Provisions permit, the Contractor may propose to blast-clean and prime extended areas, as defined in the Special Provisions, and come back at a later time to apply the remaining coats. Submit the proposed plan to the Engineer, and do not proceed until approved. Any extra costs of protecting and cleaning the partially completed work will be the Contractor's responsibility.

(f) Sealing - Fill and seal crevices and gaps between structural shapes and plates, around bolt heads or nuts, and similar areas that would retain moisture with:

- Coating materials where practicable
- Sealant, if the crevice or gap cannot be filled with coating materials. In areas that collect or channel water, apply sealant even if the coating fills the gap. Apply the sealant after complete application of the top coat.
- Backing material and sealant to fill crevices and gaps that exceed 1/4 inch. Apply sealant over the backing material to form a watertight seal.
- In areas visible to the public, sealant shall be either clear or color matched with the top coat.

(g) Adhesion - Minimum adhesion shall be 250 psi within one week of application of each coat to its substrate. The Engineer will perform adhesion tests according to ASTM D 4541, using Test Method B.

(h) Environmental Conditions - Apply coating materials only during periods when, according to testing by ASTM E 337, the:

- Air temperature is above 45° F
- Steel surface temperature is:
 - Greater than 45° F
 - Less than 115° F
- At least 5° F above the dew point
- Relative humidity is within the manufacturer's recommended range

Lengthy weather-related delays may be necessary. In scheduling the work, be aware of weather conditions likely to be encountered.

Application of coating materials will not be allowed if the Engineer determines that conditions are not favorable for proper application and performance of the coating.

If fresh coatings are damaged by the elements, replace or repair at no additional cost to the Agency.

If a coating system allows application in environmental conditions different from those specified, submit a letter from the manufacturer stating the conditions under which the coatings can be applied. Application under conditions other than specified will not be allowed without the Engineer's written approval.

Cover and protect the steel if coating is to be applied in adverse weather conditions. Heat the steel and surrounding air to the temperature specified in this subsection. Continue protecting the newly coated steel until the coating achieves proper cure.

(i) Stenciling - Stencil the month and year of application and the type of coating used in block letters 2 inches high at a location near the end of each span on the structure being coated. The exact location of stenciling will be determined by the Engineer. The color of stenciling shall be flat black unless otherwise directed.

00594.43 Inspection - The Engineer will inspect materials and each phase of preparation and coating. Do not proceed with succeeding phases until approved. Provide the inspector timely, safe access to areas where work is being performed. Allow adequate time for inspection at each hold point. Hold points shall be provided at the following times:

- (1) After completion of the containment, before blasting or waterjetting.
- (2) Completion of preparation work, before application of stripe coat.
- (3) After application of stripe coat, before application of prime coat.
- (4) After application of prime coat, before application of stripe coat.
- (5) After application of stripe coat, before application of intermediate coat.
- (6) After application of intermediate coat, before application of top coat.
- (7) After application of top coat, before moving access & containment.
- (8) After each phase of any coating repairs, before resuming work.

Repair coating system damages resulting from Agency inspection and testing at no cost to the Agency. Aspects of the preparation and coating process to be inspected and tested include, but are not limited to:

| Test | Test Method |
|--|-------------------------|
| Measuring Humidity with a Psychrometer | ASTM E 337 |
| Cleanliness of Abrasive Material | ODOT TM 616 |
| Conduct Metric Analysis of Water Soluble Ionic Contamination of Blasting Abrasives | ASTM D 4940 |
| Indicating Oil or Water in Compressed Air..... | ASTM D 4285 |
| Pictorial Surface Preparation Standards..... | SSPC-VIS 1 & SSPC-VIS 5 |
| Surface Profile of Blast Cleaned Steel by Keane -Tator Comparator | ASTM D 4417 |
| Surface Profile of Blast Cleaned Steel by Replica Tape..... | ASTM D 4417 |
| Wet Film Thickness by Notch Gages..... | ASTM D 4414 |
| Dry Film Thickness by Magnetic Gauge | SSPC-PA 2 |
| Dry Film Thickness by Tooke Gauge..... | ASTM D 4138 |
| Pull-Off Strength of Coatings (Test Method B) | ASTM D 4541 |

00594.44 Protection against Damage:

(a) Contaminated Surfaces - If the prepared surface becomes contaminated by any material, other than rust, at any time, clean the surface in a manner satisfactory to the Engineer before making the succeeding application. If the prepared surface becomes contaminated by rust at any time, prepare the contaminated area again according to 00594.41 and recoat with all specified coats. Clean, re-prepare and recoat at no cost to the Agency.

(b) Surfaces Not to Be Coated - Protect surfaces not to be coated under the Contract from blast cleaning, overspray and drippings. Remove or repair unintended coatings or other damage on these surfaces to the Engineer's satisfaction at no cost to the Agency.

Do not clean or coat galvanized steel members such as ladders, safety rails and stanchions unless otherwise directed in the Special Provisions. Protect them from damage during preparation and application operations. Repair damaged galvanizing at no additional cost to the Agency.

Protect navigation lights and conduits. If navigation lights or lenses are damaged by the preparation or coating operations, immediately repair or replace at no additional compensation. Keep navigation lights operating and visible during the hours of darkness.

(c) Handling, Shipping or Surface Damage - Exercise care in moving or handling steel in the shop, during shipping and during erection. Do not move or handle coated steel until the coating has cured.

Repair marred or damaged coated surfaces at no cost to the Agency, with the same materials and to the same condition as specified. At the completion of all work, the coating shall be complete and the surfaces shall be undamaged and clean.

(d) Other Damage - Prevent, at no cost to the Agency, damage resulting from preparation and coating work, including:

- Damage to marine or vehicular traffic or harm to pedestrians in the vicinity of the work
- Abrasive material or debris falling into an area which would create a traffic hazard
- Damage to the bridge substructure, superstructure or motorized equipment
- Damage to other property as a result of the Contractor's operations

00594.60 Repair of Damaged and Unacceptable Coatings - Repair damaged surfaces and surfaces not in compliance with requirements of 00594.42 as follows:

(a) Surface Preparation - Repair localized damage, corrosion, and unacceptable coatings. Prepare the surface by solvent cleaning in accordance with SSPC-SP 1 followed by blast cleaning in accordance with SSPC-SP 10 or as approved by the Engineer. Use a solvent that is acceptable to the paint manufacturer or as approved by the Engineer.

Areas exhibiting coating failure down to the steel substrate and which may or may not be exhibiting visible corrosion shall be prepared down to clean bare steel as per SSPC-SP 10 unless the area is small and cleaning as per SSPC-SP 15 is allowed by the Engineer so as to not damage adjacent areas. The prepared area shall extend at least 2 inches into adjacent tightly adhering, intact coating.

Areas exhibiting coating failure which does not extend down to the steel substrate shall have all loose, delaminating, non-intact, non-sound coating, or otherwise failing coating removed down to sound, still performing coating. The prepared areas shall extend at least 2 inches into adjacent tightly adhering, intact coating.

(b) Feathering of Repair Areas - Feather the existing coating system surrounding each repair location. Feather for a distance of 1 inch to 2 inches to provide a smooth, tapered transition into the existing intact coating.

Verify that the edges of coating around the periphery of the repair areas are tight and intact by probing with a putty knife according to SSPC-SP 3. Roughen the existing coating in the feathered area to ensure proper adhesion of the repair coats. Overlap the intact, still sound existing coating at least two inches.

(c) Coating Application in Repair Areas - Use the procedure in this Subsection for all repairs.

When the bare substrate is exposed in the repair area, apply all coats of the system to the specified thicknesses.

When the damage does not extend to the bare substrate, apply only the affected coats.

Maintain the thickness of the system in overlap areas within the specified total thickness tolerances, and overlap the intact, sound existing coating at least 2 inches.

00594.75 Coating System Warranty - Unconditionally warrant to the Agency that all coating work and the coating system(s), both 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 coating system warranty and related supplemental warranty performance bond for Structure No. 00683. Use the Agency-supplied warranty form. Copies of the coating system warranty and supplemental performance bond are included near the front of the Special Provisions (also see 00130.40(a)).

For purposes of this warranty, coating system defects are defined as:

- Visible rust or rust breakthrough
- Blistering, cracking or alligatoring
- Chalking or fading
- Loss of adhesion
- Cohesive failure

Upon notification of defects, correct all defects at no additional cost to the Agency. The Agency inspection of any portion of the work during the original Contract preparation and during the coating system application will not relieve the Contractor of its obligations under this warranty.

The period shall be for 36 months, starting after Project completion, also called Third Notification. During this 36 month warranty period, the Agency will inspect the coating system for defects three times, at 12, 24 and 36 months after Project completion. The Contractor will be notified in advance of each inspection and will be permitted to accompany the Agency inspector. Within 30 calendar days from the date of written notification that defects were found, make repairs to the coating system that meet the original Contract requirements.

Measurement

00594.80 New and Existing Steel Structures - No separate measurement will be made for work done under this Section.

Payment

00594.90 General:

(a) New and Existing Steel Structures - Payment for preparing and coating work as specified, including containment, worker and environmental protection and waste management, will be made at the contract lump sum amounts for the following items:

| | Pay Item | Unit of Measurement |
|-----|---------------------|----------------------------|
| (a) | Containment | Lump Sum |
| (b) | Surface Preparation | Lump Sum |
| (c) | Coating Application | Lump Sum |
| (d) | Coating Materials | Lump Sum |

Item (a) will be payment in full for furnishing materials, equipment, tools, supplies, labor and incidentals necessary to design, construct, erect, maintain, move, and remove the containment structure and to comply with the containment, worker and environmental protection and waste management standards, laws & regulations as specified.

Item (b) will be payment in full for furnishing equipment, tools, supplies, labor and incidentals necessary to prepare existing steel and new steel members as specified. There will be no separate or additional payment for surface preparation that exceeds the specified standards.

Item (c) will be payment in full for furnishing equipment, tools, supplies, labor and incidentals necessary to coat existing steel and new steel members as specified.

Item (d) will be payment in full for furnishing materials to coat and seal the steel as specified.

No separate payment will be made for correction of damages according to 00594.44 and 00594.60 as payment will be included in payment made for items (b), (c), or (d).