
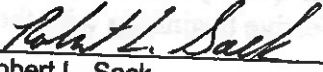


To: SUPERSEDED BY <u>EB 06-057</u> EFFECTIVE <u>5/3/07</u>		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 05-038
Title: STRUCTURAL PAINTING STANDARD SPECIFICATIONS			
Distribution: <input type="checkbox"/> Manufacturers (18) <input checked="" type="checkbox"/> Local Govt. (31) <input checked="" type="checkbox"/> Agencies (32) <input type="checkbox"/> Surveyors (33) <input checked="" type="checkbox"/> Consultants (34) <input checked="" type="checkbox"/> Contractors (39) <input type="checkbox"/> _____ ()		Approved:  Robert L. Sack Deputy Chief Engineer, Research 20 DEC 05 Date	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of May 4, 2006.
- This EI supersedes EI 97-029 and EI 05-002.
- These revisions will be incorporated into a future update of the *Standard Specifications*.

PURPOSE: The purpose of this EI is to:

- Reissue Section 572, Shop-Applied Structural Steel Paint System.
- Issue standard specifications for Section 573, Structural Steel Field Painting: Total Removal.
- Issue standard specification for Section 574, Overcoating and Localized Field Painting of Structural Steel.
- Issue Section 708 specifications for the material requirements of structural paints.
- Issue shelf notes for references to the "Paints, Structural Steel" and "Paints, Moisture Curing Urethane Systems."

TECHNICAL INFORMATION:

- This EI is being issued concurrently with EI 05-039 Incidental Painting Standard Specifications and EI 05-040 Structural Steel Painting Guidance.
- This EI disapproves several commonly used special specifications.
- Guidance pertaining to choosing the appropriate specification can be found in EI 05-040.
- Section 572 has been modified and also uses a new paint system.
- Section 573 and Section 574 are modified special specifications appearing as a standard specification for the first time. They include a significant change in the scope and methods from preceding versions. Changes include: requiring the Contractor to submit a quality control plan, more stringent requirements for profile and dry-film thickness inspection, requiring the use of recycled steel grit to reduce hazardous waste and to improve paint performance (Total Removal Jobs), hot-water pressure wash to remove grease and salts prior to field painting, requiring manufacturers to submit more standard and complete technical data sheets, use of potable water for washing, and tighter atmospheric restrictions for surface preparation and paint application.
- Specifications now include the requirement for designers to include a special note entitled "Structural Painting Details." This note should contain the following information: description of serialized items, estimated structure length, width, vertical clearance, pay items to be used, description and location for pay items 574.02 and 574.03 if necessary, stream classification, and whether or not the structure is over a public water supply.
- Pay item 574.01 should be used when the entire structure is to be overcoated. Pay item 574.02 should be used when only a portion of the structure will be overcoated. Pay items 574.02 and 574.03 may be used simultaneously on the same structure.

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- For overcoating work, tightly adhering paint must be abraded before it is painted over. This requirement will increase the cost of overcoating. The increase in cost for this work cannot be estimated at this time.
- A significant increase in cost for total removal projects is unexpected.

IMPLEMENTATION:

- Main Office Design Quality Assurance Bureau will insert the standard specifications and shelf notes in all proposals effective beginning with those projects submitted for the letting of May 4, 2006.

Disapproved Items

	Description
573.1010--18	Field Cleaning and Overcoating – SSPC 11
573.1011--18	Field Cleaning and Overcoating – SSPC 11 – (Spray Prohibited)
573.1016--18	Field Cleaning and Overcoating – SP10
573.1017--18	Field Cleaning and Overcoating – SP10 – (Spray Prohibited)
572.03-----16	Shop Applied Structural Steel Paint System
570.70-----16	Localized Paint Removal From Structural Steel By Vacuum Contained Methods
570.32-----16	Localized Painting of Bare Structural Steel
573.1011--11	Field Cleaning and Overcoating – SSPC – SP11 (Spray Prohibited)
570.8614--10	Field Cleaning and Epoxy Painting of Structural Steel – Total Removal to SP 10 (Spray Prohibited)
573.1014--03	Field Cleaning and Painting – Total Removal to SP 10 – Zinc Rich Epoxy Primer
573.1015--02	Field Cleaning and Painting – Total Removal to SP 10 (Spray Prohibited)

New Specifications

	Title
708-01	Structural Steel Paints
708-02	Structural Steel Maintenance Paints

New Pay Items

	Description
572.01nn	Structural Steel Painting: Shop Applied
573.01 nn	Structural Steel Painting: Field Applied – Total Removal
574.01 nn	Structural Steel Painting: Overcoating (Lump Sum)
574.02 nn	Structural Steel Painting: Overcoating (Square Meter)
574.03 nn	Structural Steel Painting: Localized (Square Meter)

TRANSMITTED MATERIALS:

- Shelf Notes for “Paints”
- Shelf Notes for Section 572 specifications
- Shelf Notes for Section 573 specifications
- Shelf Notes for Section 574 specifications
- Section 708 specifications
- Example of “Structural Painting Details” note format.

CONTACT: Direct questions regarding this issuance to Orlando Picozzi via e-mail at OPicozzi@dot.state.ny.us or William Feliciano via e-mail at WFeliciano@dot.state.ny.us or at the Materials Bureau at (518) 457-4595.

Make the following changes to Volume 2 of 3 of the Standard Specifications of January 2, 2002.

§ 565-2.01

Page 5-103 Delete line 3 and Add "Structural Steel Paint Class 1 708-01"

§ 565-2.04

Page 5-103 Delete lines 35 to 43 and Replace with the following:

"D. All other metal surfaces shall be cleaned to meet SSPC-SP10, "Near-White Metal Blast Cleaning" and painted in accordance with section 572, Structural Paint System: Shop Applied. The paint shall be selected from the Department's Approved List, Structural Steel Paints - Class 1. For bearings used in conjunction with unpainted steel, the color of the finish coat shall Weathered Brown as defined by § 708-05."

Section 572-Section 574

Page 5-135 Delete Section 572 in its entirety and replace with the following:

"SECTION 572 - STRUCTURAL STEEL PAINTING: SHOP APPLIED

572-1 DESCRIPTION. This work shall consist of preparing and painting new steel surfaces in a permanent facility, enclosure, or building, with four walls to grade and a roof, where surface preparation and painting activities are conducted in an environment not subject to outdoor weather conditions and/or blowing dust. All painting work, except field touchup and bolt painting, shall be conducted inside this facility. See special note entitled "Structural Painting Details" for the description and requirements of serialized items.

572-2 MATERIALS

572-2.01 Paints. Paints shall meet the requirements of §708-01 *Structural Steel Paints - Class 1*, and shall appear on the Department's Approved List, "Structural Steel Paints - Class 1". All paint applied to a single structure shall be produced by the same manufacturer. Any exception must be approved by the Engineer and the Materials Bureau Director.

A. Shelf Life. The shelf life of all paint shall be a maximum of 12 months from the date of manufacture. Paint and thinner shall arrive at the work site in new, unopened containers. The label shall include the manufacturer's name, batch number, color, paint name, and date of manufacture.

B. Paint Storage. Paint in storage shall be protected from damage and maintained in accordance with manufacturer's recommendations. Paint will be considered in storage if it is onsite for more than 8 hours prior to application.

C. Color. Each single coat of paint shall be a different color and provide substantial contrast with the underlying substrate and previous coats. The colors of the primer, stripe coat, and intermediate coat will be the Contractor's option. The color of the finish coat shall be as specified in contract documents.

D. Data Sheets. The Contractor shall supply the Engineer with the paint manufacturer's technical data and materials safety data sheets for each paint to be applied. The data sheets will be delivered to the Engineer a minimum of five work days prior to beginning of work. Data sheets shall include all information required by §708-01 *Structural Steel Paints - Class 1*.

572-2.02 Abrasive for Blast Cleaning. Abrasive material for blast cleaning shall be selected by the Contractor. Silica sand and other types of nonmetallic abrasive containing more than one percent free silica, by weight, will not be allowed. The abrasive blasting shall produce an angular anchor profile suitable for the paint system to be applied.

572-2.03 Paint Inspection Equipment. Prior to the start of work, the Contractor shall supply the Engineer with the following specifications and equipment in good working order:

1. One bound copy of the Steel Structures Painting Council, surface preparation specification, SSPC-SP 10 - *Near-White Metal Blast Cleaning*.
2. One bound copy of the Steel Structures Painting Council, surface preparation specification, SSPC SP-1 - *Solvent Cleaning*.
3. One bound copy of the most current Steel Structures Painting Council Pictorial Standards, SSPC-VIS 1, *Guide and Reference photographs for steel surfaces prepared by dry-abrasive blast cleaning*.
4. One bound copy of the Steel Structures Painting Council method SSPC-PA2, Paint Application Specification No. 2 - *Measurement of Dry Film Thickness With Magnetic Gages*.
5. One copy of ASTM D 4417 Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.
6. One copy of ASTM D 4285 Test Method for Indicating Oil or Water in Compressed Air
7. One Air Thermometer, pocket type, -10°C to +40°C.
8. One non-contact Infrared Thermometer, -10°C to +40°C.
9. One Contact Thermometer, -10°C to +40°C.
10. One Magnetic Dry-Film Thickness Gage, Type 2 (as defined per SSPC PA-2), with a display capable of measuring 1 µm to 1500 µm in 1 µm increments, with calibration shims.
11. Two Wet-Film Thickness Gages, Prong-Type, capable of measuring 25 µm to 250 µm in 25 µm increments.
12. Psychrometer and US Weather Bureau Psychrometric Tables.
13. Profile micrometer with extra coarse replica tape.

All equipment will be returned to the Contractor upon completion of the work.

572-3 CONSTRUCTION DETAILS. All structural steel members and other miscellaneous steel items shall be cleaned and painted as per contract documents.

The Contractor shall provide adequate access, suitable lighting, and time for inspections to be made. Any work completed while the Engineer has been restricted from access, shall be recleaned and repainted at no additional cost to the State.

572-3.01 Quality Control Plan. The Contractor shall provide the Engineer with a copy of the Contractor's Quality Control (QC) procedures and/or Quality Control Plan (QCP). The QCP describes the minimum QC activities that will be performed by Contractor's QC personnel to ensure compliance. The QCP shall at a minimum, include operating procedures and maintenance records for equipment on site, proof of formal QC training for the Contractor's QC personnel on site, and daily reports including the following information:

- Compressed Air Cleanliness
- Dry Film Thickness
- Air Temperature
- Humidity and Dew Point

- Surface Temperature
- Abrasive Cleanliness Checks
- Degree of Cleanliness Achieved
- Surface Profile
- Batch Numbers of Paint Used
- Batch Numbers of Thinner Used
- Mixing According to Specification

The Contractor shall provide daily reports to the Engineer upon request. The reports shall be submitted no later than 24 hours following the completion of the day's work.

572-3.02 SURFACE PREPARATION.

A. Abrasive Blast Cleaning.

1. Atmospheric Conditions. Abrasive blast cleaning operations shall not be conducted under the following conditions:

- a. The relative humidity exceeds 85%.
- b. When the substrate is damp or covered by frost.
- c. The surface temperature is less than 3°C above the dew point.

2. Solvent Cleaning. Before abrasive blast cleaning begins, steel shall be solvent cleaned of all deposits of oil, grease, dirt, salt, or other contaminants by methods specified in SSPC-SP1, *Solvent Cleaning*.

3. Steel Cleanliness and Profile. All structural steel surfaces to be painted shall be abrasive-blast cleaned in accordance with SSPC-SP10, *Near-White Metal Blast Cleaning*. All abrasive blast cleaning and painting shall be performed at the same facility.

The anchor profile shall be measured in accordance with ASTM D4417, Method C. The Contractor shall ensure that the anchor profile is within the range indicated on the paint manufacturer's data sheets. The profile shall, at a minimum, be measured once per shift and three times in various locations for every 200 square meters prepared, unless otherwise ordered by the Engineer. The anchor profile shall not exceed 75 µm.

All fins, tears, slivers, burred and sharp edges that are present or occur during the blasting operation shall be removed by grinding, and then the area shall be reblasted to provide the required profile.

4. Equipment. All equipment and compressors used in the cleaning operation shall be equipped with filters and traps to prevent moisture, oil, and other contaminants from being deposited on clean surfaces. The air cleanliness shall be verified by the Contractor with the white blotter test in accordance with ASTM D4285 at least once per shift for each compressed air system.

B. Cleaning Area. The area cleaned shall be limited to that which can be cleaned and prime coated within an 8-hour period. Cleaned areas shall be approved by the Engineer prior to priming. Areas that exhibit flash rusting within the 8-hour period shall be recleaned.

C. Visual Standards. After abrasive blasting is completed, cleaned surfaces shall be compared to SSPC-Vis 1, *Guide and Reference Photographs for Steel Surfaces Prepared By Dry Abrasive Blast Cleaning* Pictorial Standards as applicable. All surfaces shall be free of blasting products and other residues when blasting operations are completed. Surfaces shall be cleared of all foreign matter by means of oil-free, moisture-free, compressed air or vacuum systems.

572-3.03 PAINTING. The Contractor shall apply three full coats and a stripe coat of paint to all surfaces cleaned to SP-10. In addition, all cleaned steel surfaces within 2 meters from a bridge joint shall receive an additional coat of intermediate paint, resulting in four coats of paint in these areas. The paint shall be applied in the following order: primer, intermediate, stripe, and the finish coat. Damage resulting from fabrication, handling and storage in the shop shall be restored before leaving the shop.

Unless otherwise noted, the contractor shall adhere to the procedures and methods for application as described in SSPC-PA 1, Section 7.

A. Atmospheric Conditions. Paint shall not be applied when the receiving surface and ambient temperatures are less than 5°C or greater than 38°C. If the temperature range listed on the manufacturer's data sheets is more restrictive, the manufacturer's range shall be used. No paint shall be applied unless the receiving surface is dry.

Paint shall not be applied when the relative humidity is more than 85% unless the painting manufacturer's data sheets have a more restrictive range. Paint shall not be applied if the receiving surface is less than 3°C above the dew point temperature.

B. Paint Mixing. All paint shall be thoroughly mixed with mechanical mixers in accordance with the manufacturer's recommendations. After mixing, the bottom of the container shall be free of any unmixed pigment prior to use.

C. Solvents and Thinners. Paint may be thinned if recommended by the manufacturer and approved by the Engineer. The primer shall not be thinned such that the resulting VOC level exceeds 500 g/L. Intermediate and finish coats shall not be thinned where the resulting VOC level exceeds 340 g/L. The manufacturer's data sheets shall advise the Contractor and Engineer of the maximum amount of thinner allowed.

Use of unauthorized thinners, or using excess amounts of thinners is prohibited. Any area where unauthorized solvents or thinners are used shall be cleaned and repainted at no additional cost.

D. Paint Application. Painting shall not begin until cleaned surfaces have been inspected and approved by the Engineer. Paint may be applied using spray, brush, or roller, unless otherwise indicated by the contract documents. All paint shall be applied so as to produce a uniform, even coating free of runs, sags, drips, ridges, or other defects. Roller nap shall be limited in accordance with the paint manufacturer's recommendation. Brushes and rollers used to apply the paint must be of a quality to produce a smooth uniform coating without leaving fibers in the coating.

All metal surfaces in contact with concrete shall not be painted. Priming shall begin only after all welding and fabrication work is completed.

E. Stripe Coat. A stripe coat shall extend a minimum of 25 mm away from the following surfaces: all welds, rivets, bolts, nuts, edges of plates and structural members, angles, bearings, lattice pieces or other shapes, corners, and crevices. To provide contrast, paint for stripe coating shall be a different color than the receiving surface. The stripe coat shall use the intermediate paint and be applied after the intermediate coat. The stripe coat shall be brush applied without being thinned. The stripe coat will be applied in accordance with manufacturer's recommendations, with particular attention to the film thickness, recoat window, and cure schedule. Areas near bridge joints that are to receive an additional coat of intermediate paint shall also receive a stripe coat where necessary as described above.

A stripe coat shall not be applied to any slip critical surfaces.

F. Paint Film Thickness. Paint shall be applied to produce the specified dry-film thickness as directed by the range listed on the paint manufacturer's data sheets. The dry-film thickness (DFT)

shall be determined in accordance with SSPC-PA 2, Paint Application Specification No. 2 - *Measurement of Dry Film Thickness with Magnetic Gages*, using a Type 2 fixed probe magnetic gages. Dry film thickness gauges shall be calibrated over a blasted, approved surface.

DFTs of the intermediate and finish coats shall be determined by subtracting the average DFT readings of the previous coat(s) from the actual DFT reading. An average DFT value shall be recorded and calculated for every 100 m² prepared. The average shall be calculated using a minimum of 5 spot measurements as defined by SSPC-PA2.

Areas failing to meet the specified minimum dry-film thickness shall be top coated with the same paint to produce the total dry-film thickness required. The top coating must be performed within the paint manufacturer's specified recoat window.

The Engineer may require any area exceeding the manufacturer's recommended dry-film thickness to be blast cleaned to the SP-10 condition.

Slip Critical Connections. All metal to metal, slip-critical contact surfaces shall not be painted unless the paint system is identified as being 'Slip-B Approved' on the Department's Approved List, 'Structural Steel Paints - Class 1'. Painted slip-critical connection surfaces shall receive primer only.

Each painted connection shall receive a minimum of 5 spot measurements and analyzed in accordance with SSPC-PA2. DFT ranges for slip-critical surfaces can be found on the Department's Approved List, 'Structural Steel Paints - Class 1'. Slip-critical primed surfaces exceeding the listed DFT range shall be cleaned and restored to SP-10 at no additional cost to the State.

G. Painting Schedule. Primer shall be applied to approved, abrasive-blasted surfaces within 8 hours of the final cleaning operation. If the Contractor fails to apply primer to the surface within 8 hours of cleaning, the surface shall be restored in accordance with the SP-10 requirements, at no additional cost to the State.

To prevent intercoat adhesion failure, recoating must be performed within the manufacturer's recommended recoat window, or 14 days, whichever is shorter. If the contractor fails to recoat within the specified time period, the surface to be painted shall be cleaned and abraded, in accordance with manufacturer's recommendations, to ensure adhesion of the following coat at no additional cost.

If the steel has become dirty between coats, the Contractor shall wash the bridge at no additional cost to the State.

Manufacturer's recommendations shall be observed for cure to handle, and cure to top coat schedules.

H. Stenciling. The following information shall be stenciled on at least one steel element or on the inside web of a fascia member coated under this specification, unless otherwise directed by the Engineer:

1. Month and year of completion
2. Contract number
3. SP10
4. Name of Paint Manufacturer
5. Name of Shop that performed painting
6. Primer, Intermediate, and Finish coat names

The stenciled lettering should be approximately 150 mm in height and be a contrasting paint color to the top coat.

572-3.04 Field Painting. The only field work allowed is touch-up work after steel erection and subsequent concrete placement has been completed. All field painting shall be done at no additional cost

to the State. All the requirements of this specification shall apply to field painted material with the following modifications:

A. Hardware. Bolt heads, washers, nuts, bolt thread extensions, and other miscellaneous steel surfaces not painted in the shop shall be cleaned as per SSPC SP-1 and painted after the bolts have been installed and accepted. Abrasive blasting of the bolts is not required. Any dye present on galvanized hardware shall be cleaned in accordance with manufacturer's recommendation prior to painting. The Contractor shall submit the dye-cleaning procedure to the Engineer five days prior to cleaning.

B. Surface Preparation of Damaged Areas. All visible dirt, grease, and other foreign matter shall be removed first by pressure washing and solvent cleaning as per SSPC SP-1 as needed. Areas exhibiting damaged or deteriorated paint not extending to the steel surface shall be hand or power-tool cleaned as necessary to remove damaged or deteriorated, loosely adhered paint. Loosely adhered paint will lift when scraped with a dull putty knife. All edges of paint surrounding the repair area shall be tightly adherent and feathered. These edges and the surrounding painted surfaces to receive a (repair) topcoat(s) shall be abraded to provide a suitable anchor profile for the paint. Areas that exhibit damage of the paint system down to the steel surface shall be cleaned with power tools to SSPC SP-11 and shall exhibit a suitable anchor profile for the primer paint. All power and blasting tools will be vacuum-sealed units. All surrounding steel that has been previously painted in the shop shall be protected from damage during cleaning operations. Repairs shall be smoothly transitioned into surrounding new paint.

C. Application. Application shall be made by brush and roller only. Areas of steel exhibiting damage not extending down to the steel surface shall receive two coats of paint: intermediate and finish coat. Damage extending to the steel surface shall receive three coats of paint: primer, intermediate and finish coat. These coats of paint shall be applied at a dry film thickness as recommended by the paint manufacturer for such (repair) application.

572-4 METHOD OF MEASUREMENT. The quantity to be measured for payment will be in square meters of structural steel painted, measured to the nearest whole square meter. The total payment quantity will be the number of square meters of structural steel to be painted. Structural elements less than 1 square meter will not be included in the total payment quantity.

572-5 BASIS OF PAYMENT. The unit price bid shall include the cost of all labor, materials, and equipment necessary to complete the work.

Progress payments will be made for 80% of total payment quantity upon delivery. Shop-painted steel will be considered properly painted only when accompanied by the Engineer's or Inspector's written certification that the delivered steel was painted in accordance with the requirements of this Section. The remaining 20% of payment will be made upon completion of cleaning and painting all bolt heads, nuts, washers, bolt thread extensions, and damaged areas.

Payment will be made under:

Item No.	Item	Pay Unit
572.01nnnn	Structural Steel Painting: Shop Applied	Square Meter

NOTE: nnnn denotes a serialized pay item.

SECTION 573 – STRUCTURAL STEEL PAINTING: FIELD APPLIED - TOTAL REMOVAL

573-1 DESCRIPTION. This work shall consist of pressure washing, abrasive blast cleaning to remove all paint, rust, rust scale, mill scale, corrosion producing contaminants, and other foreign matter, and painting structural steel surfaces. See Special Note entitled *Structural Painting Details* for the description and requirements for serialized items.

573-2 MATERIALS

573-2.01 Paints. Paints shall meet the requirements of §708-01 *Structural Steel Paints – Class 1*, and shall appear on the Department's Approved List, 'Structural Steel Paints – Class 1'. All new paint to be applied to a single structure shall be produced by the same manufacturer. Any exception shall be approved by the Engineer and the Materials Bureau Director.

A. Shelf Life. The shelf life of all paint shall be a maximum of 12 months from the date of manufacture. Paint and thinner shall arrive at the work site in new, unopened containers. The label shall include the manufacturer's name, batch number, color, paint name, and date of manufacture.

B. Paint Storage. Paint in storage shall be protected from damage and maintained in accordance with manufacturer's recommendations. Paint will be considered in storage if it is onsite for more than 8 hours prior to application.

C. Color. Each single coat of paint shall be a different color and provide substantial contrast with the underlying substrate and previous coats. The colors of the primer, stripe coat, and intermediate coat will be the Contractor's option. The color of the finish coat shall be as specified in contract documents.

D. Technical Data. The Contractor shall supply the Engineer with the paint manufacturer's technical data and material safety data sheets for each paint to be applied. The data sheets shall be delivered to the Engineer a minimum of five work days prior to beginning of work. Data sheets shall include all information required by §708-01 *Structural Steel Paints – Class 1*.

573-2.02 Water for Washing. Water for pressure washing shall be potable water. Any detergent or soluble salt remover used must receive approval by the paint manufacturer and the Materials Bureau. Water shall not be recycled.

573-2.03 Abrasive for Blast Cleaning. Abrasive blast media for blast cleaning shall be recyclable, ferrous metallic, abrasive grit. All new metallic abrasive shall be in compliance with the specifications of SSPC-AB 3 Ferrous Metallic Abrasive. All ferrous metallic abrasive used shall be recycled and cleaned in accordance with SSPC-AB 2. The Contractor shall select the size, blend, and hardness of the abrasive to produce an angular anchor profile of a recommended depth as indicated on the manufacturer's data sheets.

All ferrous metallic abrasive arriving on the job site shall be new, and invoices shall be submitted for acceptance. All recycling equipment shall arrive empty and clean.

573-2.04 Paint Inspection Equipment. Prior to the start of work the Contractor shall supply the Engineer with the following specifications and equipment in good working order:

1. One bound copy of the Steel Structures Painting Council surface preparation specification, SSPC SP-1 – *Solvent Cleaning*.
2. One (1) bound copy of the Steel Structures Painting Council surface preparation specification, SSPC-SP 10 – *Near-White Metal Blast Cleaning*.

3. One bound copy of the most current Steel Structures Painting Council Pictorial Standards, SSPC-VIS 1, *Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning*.
4. One bound copy of the Steel Structures Painting Council specification SSPC-PA2, *Paint Application Specification No. 2 - Measurement of Dry Film Thickness With Magnetic Gages*.
5. One bound copy of Steel Structures Painting Council specification SSPC AB-2 *Specification for Cleanliness of Recycled Ferrous Metallic Abrasives*.
6. One bound copy of Steel Structures Painting Council specification SSPC AB-3 *Specification for Newly Manufactured or Re-Manufactured Steel Abrasive*.
7. One copy of ASTM D 4417 *Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel*.
8. One copy of ASTM D 4285 *Test Method for Indicating Oil or Water in Compressed Air*.
9. One Air Thermometer, pocket type, -10°C to +40°C.
10. One noncontact Infrared Thermometer, -10°C to +40°C.
11. One Contact Thermometer, -10°C to +40°C.
12. One Magnetic Dry-Film Thickness Gage, Type 2 (as defined per SSPC PA-2), with a display capable of measuring 1 µm to 1500 µm in 1 µm increments, with calibration shims.
13. Two Wet-Film Thickness Gages, Prong-Type, capable of measuring 25 µm to 125 µm in 25 µm increments.
14. Psychrometer and US Weather Bureau Psychrometric Tables.
15. Profile micrometer with extra coarse and extra coarse plus replica tape.

All equipment will be returned to the Contractor upon completion of the work.

573-3 CONSTRUCTION DETAILS. The Contractor shall clean and paint all structural steel members, railings, downspouts, and other miscellaneous steel items as indicated in the contract documents.

The Contractor shall provide adequate access, suitable lighting, and time for inspections to be made. Any work done while the Engineer has been restricted from access, shall be recleaned and repainted, at no additional cost to the State to the State.

573-3.01 Quality Control Plan. The Contractor shall provide the Engineer with a copy of the Contractor's Quality Control (QC) procedures and/or Quality Control Plan (QCP). The QCP describes the minimum QC activities that will be performed by Contractor's QC personnel to ensure compliance. The QCP shall minimally include operating procedures and maintenance records for equipment on site, proof of formal QC training for the Contractor's QC personnel on site, and daily reports including the following information:

- Compressed Air Cleanliness
- Dry Film Thickness
- Air Temperature
- Humidity and Dew Point
- Surface Temperature
- Abrasive Cleanliness Checks
- Degree of Cleanliness Achieved
- Surface Profile
- Batch Numbers of Paint Used
- Batch Numbers of Thinner Used
- Mixing According to Specification

The Contractor must provide daily reports to the Engineer at the conclusion of cleaning work and painting work and prior to inspection of such work by the Engineer. Reports at the conclusion of cleaning and

painting work shall include all pertinent information listed above that relate to such work and shall be in a format previously agreed to under the QCP.

573-3.02 Surface Preparation. Steel surfaces shall be prepared for painting by a combination of pressure washing, solvent cleaning, and abrasive blast cleaning.

Pressure washing shall be performed first, followed by abrasive blast cleaning to remove all paint, rust, rust scale, and mill scale, as per SSPC SP-10, *Near-White Metal*. If heavy deposits of rust and scale are present, they shall be removed by hand or power tool prior to pressure washing. Deposits of bird droppings taller than 13 mm shall be removed prior to pressure washing.

A. Pressure Washing and Solvent Cleaning. All steel surfaces to be painted shall be pressure washed, using an operating pressure range of 12.5 MPa to 14 MPa, a minimum flow of 13 L/minute, and a water temperature of 85°C to 93°C. The nozzle shall be held at a distance of 150 mm to 300 mm from the steel surface. Pressure washing shall only be allowed when ambient air temperatures are greater than 4.5°C and rising. In no case will pressure washing be conducted when spent wastewater could freeze on roadway or bridge surfaces or in any other way create a hazardous situation. The washing is intended to remove contaminants from the surface, not to remove tightly adhered paint. Oil and grease shall be removed by solvent cleaning as described in SSPC SP1, *Solvent Cleaning*. The areas shall be pressure washed again following this cleaning.

When the washing is completed, the cleaned surfaces shall be free of dust, dirt, oil, grease, animal waste, salts, and other debris

A containment shall be suspended around and beneath the work area during pressure washing. The containment for pressure washing is intended to capture solid paint chips and other solid debris that may become dislodged from washing operations. Unless otherwise noted, spent wash water will not require collection and will be allowed to fall to the underlying ground or waterway, provided that the other requirements of this specification are met.

Special note, Structural Painting Details, will provide scheduling requirements for washing a structure over a body of water. Spent wash water over a public water supply or the New York City watershed shall be collected and diverted to the adjoining land mass.

If steel surfaces become contaminated or 7 calendar days elapse between washing and abrasive blasting cleaning, they shall be rewashed at no additional cost to the State.

The surface shall be allowed to dry before subsequent abrasive blast cleaning begins.

B. Abrasive Blast Cleaning.

1. Atmospheric Conditions. Blast cleaning operations shall not be conducted under the following conditions:

- a. The relative humidity exceeds 85%.
- b. When the substrate is damp or covered by frost.
- c. The surface temperature is less than 3°C above the dew point.

2. Steel Cleanliness and Profile. All structural steel surfaces shall be blast cleaned to SSPC SP-10, *Near-White Metal*.

The anchor profile shall be measured in accordance with ASTM D4417, Method C. The Contractor shall ensure that the anchor profile is within the range indicated on the paint manufacturer's data sheets. The profile, at a minimum, shall be measured five times in various locations every 200 square meters prepared and once per work shift, unless otherwise ordered by the Engineer. The anchor profile shall not exceed 100 µm unless approved by the Engineer. The Engineer may approve a profile greater than 100 µm if an area is severely corroded or pitted. If the Contractor exceeds the 100 µm profile, the Contractor will be required to measure the profile

using extra-coarse-plus replica tape and apply an additional mist coat of primer in accordance with manufacturer's recommendations to obtain a minimum 50µm film build over the profile peaks, at no additional cost to the State.

All fins, tears, slivers, flame-cut edges, burred and sharp edges that are present or occur during the blasting operation shall be removed by grinding, and then the area shall be reblasted to provide the required profile.

Special attention shall be given to the edges of beam flanges, angles and plates, bearings, rivets, the heads of nuts and bolts, structural steel surrounding bridge joints, and similar surfaces that are marginally accessible and difficult to clean.

Upon completion of blast cleaning and prior to inspection, the containment shall be vacuumed and the cleaned surfaces shall be free of all blasting products and paint debris. Surfaces shall be free of all abrasive prior to inspection. Surfaces shall be cleared of all foreign matter by means of oil-free, moisture-free, compressed air or vacuum systems

All cleaned surfaces will be inspected by the Engineer prior to painting. Any areas that are painted before being inspected shall be cleaned and restored to the SP-10 standard and repainted at no additional cost to the State. If the cleaned surface begins to rust or becomes contaminated in any matter prior to applying primer, the surface shall be restored to SP-10 standard.

3. Steel Grit. The recyclable abrasive shall be cleaned of all paint, chips, rust, mill scale, and other foreign material after each use, prior to reuse. The cleanliness of the recycled abrasive during use shall be confirmed in accordance with SSPC-AB2. The Contractor shall execute, record, and provide the Engineer results of the nonabrasive residue test, water soluble test, and oil content test daily. The Engineer may be present during this testing. The Contractor shall also execute and provide lead content test results weekly. All equipment used for cleaning abrasive shall be specifically designed for this purpose and accepted by the Engineer.

The Contractor shall maintain a balance in the size distribution of the abrasive work mix for the duration of the abrasive blasting operations to maintain a uniform profile across the surfaces to be blasted. The work mix shall not be predominantly coarse or fine, and shall be maintained through proper removal of expended abrasive and its timely replenishment.

4. Protection of Newly Painted Surfaces. Throughout abrasive blast cleaning work, care shall be taken to protect newly painted surfaces from the cleaning operations. Tarps, covers, or other devices shall be used to protect new paint from contamination or damage. Contaminated areas of new paint shall be cleaned as necessary prior to the next coat of paint. Damaged paint shall be blast cleaned to the required condition, and then repainted at no additional cost to the State.

5. Vacuuming. After cleaning operations are completed, all debris generated by the cleaning work shall be removed by vacuuming using HEPA-filtered vacuums. A HEPA filter shall be defined as a filter that is at least 99.97% efficient for particles that are 0.3µm in diameter, or larger.

6. Equipment. All equipment and compressors used in the cleaning operation shall be equipped with filters and traps to prevent moisture, oil, and other contaminants from being deposited on clean surfaces. The air cleanliness shall be verified by the Contractor with the white blotter test in accordance with ASTM D4285 at least once per shift for each compressed air system.

7. Cleaning Area. The area cleaned shall be limited to that which can be cleaned, inspected and prime coated within a 10-hour period. Cleaned areas shall be inspected by the Engineer prior

to priming. Areas that exhibit flash rusting or fail to meet the local standard prior to painting shall be re-cleaned to the approved standard at no additional cost to the State.

C. Visual and Project Standards. The Contractor shall prepare at least one project cleaning standard for each representative area on the structure that is being prepared for painting. Multiple standards may be required if the cleaned steel differs significantly from the photographic standards due to surface conditions, or other factors such as distance of the standard from the work area.

The prepared cleaning standard shall conform to SSPC VIS 1, "*Guide and Reference Photographs for Steel Surfaces Prepared By Dry Abrasive Blast Cleaning*" Pictorial Standard as applicable, and shall be approved by the Engineer before the start of general cleaning work. Each cleaning standard shall be at least 300 mm x 300 mm in size, and shall be located in an area of the structure that is easily accessible, and approved by the Engineer. The Contractor shall protect the work standard from corrosion and contamination throughout the duration of work by applying a clear coat of polyurethane. At the completion of cleaning work, the cleaning standard shall be cleaned and painted. If the project standard becomes deteriorated, or otherwise ineffective, it shall be reestablished at no additional cost to the State. In case of a dispute over the visual standard, the written standard shall take precedence.

573-3.03 PAINTING. The Contractor shall apply three full coats of new paint and one stripe coat to all surfaces cleaned to SP-10. The paint shall be applied in the following order: primer, intermediate coat, stripe coat, and the finish coat. All steel surfaces within 2 meters of a bridge joint shall receive an additional full coat of intermediate paint.

A. Atmospheric Conditions. Paint shall not be applied when the receiving surface and ambient temperatures are less than 5°C or greater than 38°C, unless the manufacturer's recommendations for temperature are more restrictive. No paint shall be applied unless the receiving surface is absolutely dry.

Paint shall not be applied when the relative humidity is more than 85% unless the paint manufacturer's requirements are more restrictive. No paint shall be applied during rain or when rain is forecast to occur by the National Weather Service for the project location during painting operations. All painted surfaces shall be protected from direct exposure to rain for the time interval recommended by the paint manufacturer for proper cure. The Contractor shall observe the dew point and humidity restrictions listed on the manufacturer's data sheets.

If an epoxy coating is exposed to temperatures or humidity conditions outside of the manufacturer's recommended values prior to cure, all affected surfaces shall be visually examined for greased or oily surfaces which may have formed. The Engineer may require the Contractor to use a commercially available amine blush test kit at locations chosen by the Engineer. If testing indicates the presence of an amine blush or if there is any oily film on the surface, the surfaces shall be cleaned and prepared for topcoating in accordance with paint manufacturer's recommendations at no additional cost to the State.

B. Paint Mixing. All paint shall be thoroughly mixed with mechanical mixers in accordance with the manufacturer's recommendations. After mixing, the bottom of the container shall be free of any unmixed pigment prior to use.

C. Solvents and Thinners. Paint may be thinned if recommended by the manufacturer and approved by the Engineer. The primer shall not be thinned such that the resulting VOC exceeds 500 g/L. The intermediate and finish paints shall not be thinned such that the resulting VOC level exceeds 340 g/L. The manufacturer's data sheets shall advise the Contractor and Engineer of the maximum amount of thinner allowed.

Use of unauthorized thinners, or using excess amounts of thinners is prohibited. Any area where unauthorized or improper amounts of solvents or thinners are used shall be recleaned and repainted at no additional cost to the State. All thinning shall be performed in the presence of the Engineer.

D. Paint Application. Painting shall not begin until cleaned surfaces have been inspected and approved by the Engineer. Paint may be applied using spray or brush and roller, unless otherwise indicated by the contract documents. All paint shall be applied so as to produce a uniform, even coating free of runs, sags, drips, ridges, or other defects. Roller nap shall be limited in accordance with the paint manufacturer's recommendation. Brushes and rollers used to apply the paint must be of a quality to produce a smooth uniform coating without leaving fibers in the coating.

Protection against paint spatter, spillage, wind blown paint, or similar releases of paint shall be provided. Covers, tarps, mesh, and similar materials shall be placed around the work area to protect public and private property, pedestrian, vehicular or marine traffic, all portions of the bridge, highway appurtenances, waterways, and similar surrounding areas and property, upon, beneath, or adjacent to the structure. The use of spray equipment for paint application shall be allowed within containments provided that the aforementioned protection against paint release is provided, all equipment used (including tarps, mesh and similar materials) meets all safety requirements for such enclosed use with paint spraying, and all OSHA requirements for safety and ventilation are met.

E. Stripe Coat. A stripe coat shall extend a minimum of 25 mm away from the following surfaces: all welds, rivets, bolts, nuts, edges of plates and structural members, angles, bearings, lattice pieces or other shapes, corners, and crevices. Areas near bridge joints that are to receive an additional coat of intermediate paint shall also receive a stripe coat where necessary as described above. To provide contrast, paint for stripe coating shall be a different color than the receiving surface. The stripe coat shall use the intermediate paint and be applied after the intermediate coat. The stripe coat shall be brush applied without being thinned. The stripe coat will be applied in accordance with the manufacturer's recommendations, with particular attention to the film thickness, recoat window and cure schedule.

F. Paint Film Thickness. Paint shall be applied to produce the specified dry-film thickness as directed by the range listed on the paint manufacturer's data sheets. The dry-film thickness shall be determined in accordance with SSPC-PA 2, Paint Application Specification No. 2 - *Measurement of Dry Film Thickness with Magnetic Gages*, using a Type 2 fixed probe magnetic gages. Dry-film thickness gauges shall be calibrated over a blasted, approved surface.

DFTs of the intermediate and finish coats shall be determined by subtracting the average DFT readings of the previous coat(s) from the actual DFT reading. An average DFT value shall be recorded and calculated for every 100 m² prepared. The average shall be calculated using a minimum of 5 spot measurements as defined by SSPC-PA2.

Areas failing to meet the specified minimum dry-film thickness shall be top coated with the same paint to produce the total dry film thickness required. The top coating must be performed within the paint manufacturer's specified recoat window.

The Engineer may require any area exceeding the manufacturers recommended dry-film thickness to be blast cleaned to the SP-10 condition.

G. Painting Schedule. Primer shall be applied to approved, abrasive-blasted surfaces according to section §573-3.02, B. 7 of this specification.

The intermediate coat shall be applied within 72 hours of the final cleaning operation. To prevent intercoat adhesion failure, the topcoat shall be applied within the manufacturer's recommended recoat window, or 14 days, whichever is shorter. If the contractor fails to topcoat within the specified time

period, the surface to be painted shall be cleaned and abraded, in accordance with manufacturer's recommendations, to ensure adhesion of the following coat at no additional cost.

If the steel has become dirty between coats, the Contractor shall wash the bridge again at no additional cost to the State.

Manufacturer's recommendations shall be observed for cure to handle, and cure to top coat schedules.

H. Stenciling. After the finish coat of paint has cured, the Contractor shall stencil the following information on the inside web of the fascia member, near the BIN plate, unless otherwise directed by the Engineer:

1. Month and year of completion
2. Contract number
3. SP10
4. Name of Paint Manufacturer
5. Name of Contractor
6. Primer, Intermediate, and Finish coat names

The stenciled lettering should be approximately 150 mm in height and be a contrasting paint color to the top coat.

573-4 METHOD OF MEASUREMENT

The work under this item will be measured on a lump sum basis per structure.

573-5 BASIS OF PAYMENT

The lump sum price bid shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work, including the cost of providing protection against damage to public and private property during surface preparation and paint application. Payment for the containment, collection and disposal of dust and paint waste generated by surface preparation work shall be paid for separately.

Progress payments will be based on the percentage of steel cleaned and painted. No more than 60% of the quantity will be paid for surface preparation and priming. The remaining amount will be paid following the satisfactory completion of work.

Payment will be made under:

Item No.	Item	Pay Unit
573.01nnnn	Structural Steel Painting Field Applied - Total Removal	Lump Sum

NOTE: nnnn denotes a serialized pay item.

SECTION 574 – STRUCTURAL STEEL PAINTING: OVERCOATING AND LOCALIZED

574-1 DESCRIPTION. This work shall consist of pressure washing and power-tool or vacuum-blast cleaning of damaged paint areas and corroded structural steel surfaces, and painting surfaces described in contract documents. See Special Note entitled *Structural Painting Details* for the description and requirements of serialized items.

574-2 MATERIALS

574-2.01 Paints. Paints shall meet the requirements of §708-02 *Structural Steel Paints Class 2* and shall appear on the Department's Approved List, "Structural Steel Paints – Class 2". Paints shall be approved for either localized application, overcoating application, or both.

All new paint to be applied shall be produced by the same manufacturer. Any exception must have prior approval of the director of the Materials Bureau and the Engineer.

A. Shelf Life. The shelf life of all paint shall be a maximum of 12 months from the date of manufacture. Paint and thinner shall arrive at the work site in new, unopened containers. The label shall include the manufacturer's name, batch number, color, paint name, and date of manufacture.

B. Paint Storage. Paint in storage shall be protected from damage and maintained in accordance with manufacturer's recommendations. Paint will be considered in storage if it is onsite for more than 8 hours prior to application.

C. Color. Each single coat of paint shall be a different color and provide substantial contrast with the underlying substrate and previous coats. The color of the finish coat shall be as specified in contract documents. The color of the other coats will at the Contractor's option.

D. Technical Data. The Contractor shall supply the Engineer with the paint manufacturer's technical data and materials safety data sheets for each paint to be applied. The data sheets shall be delivered to the Engineer a minimum of five work days prior to beginning of work. Data sheets shall include all information required by §708-02 *Structural Steel Paints Class 2*.

574-2.02 Water for Washing. Water for pressure washing shall be potable water. Any detergent or soluble salt remover used must receive approval by the paint manufacturer and the Materials Bureau. Water shall not be recycled.

574-2.03 Abrasive for Blast Cleaning. Abrasive material for blast cleaning shall be selected by the Contractor. Silica sand and other types of nonmetallic abrasive containing more than one percent free silica, by weight, will not be allowed. The abrasive blasting shall produce an angular anchor profile suitable for the paint system to be applied.

574-2.04 Paint Inspection Equipment. Prior to the start of work the Contractor shall supply the Engineer with the following specifications and equipment in good working order:

1. One bound copy of the Steel Structures Painting Council surface preparation specification, SSPC SP-1 – *Solvent Cleaning*.
2. One (1) bound copy of the Steel Structures Painting Council surface preparation specification, SSPC-SP 11 – *Power Tool Cleaning to Bare Metal*.
3. One (1) bound copy of the Steel Structures Painting Council surface preparation specification, SSPC-SP 10 – *Near-White Metal Blast Cleaning*.
4. One bound copy of the Steel Structures Painting Council pictorial standards, SSPC-VIS 3, *Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaned Steel*.
5. One bound copy of the most current Steel Structures Painting Council pictorial standards, SSPC-VIS 1, *Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning*.
6. One bound copy of the Steel Structures Painting Council method SSPC-PA2, *Paint Application Specification No. 2 - Measurement of Dry Film Thickness With Magnetic Gages*.
7. One copy of ASTM D 4417 Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.
8. One copy of ASTM D 4285-83 (1999) Test Method for Indicating Oil or Water in Compressed Air.
9. One Air Thermometer, pocket type, -10°C to +40°C.
10. One noncontact Infrared Thermometer, -10°C to +40°C.

11. One Contact Thermometer, -10°C to +40°C.
12. One Paint Thermometer, -10°C to +40°C.
13. One Magnetic Dry-Film Thickness Gage, Type 2 (as defined per SSPC PA-2), with a display capable of measuring 1 µm to 1500 µm in 1 µm increments, with calibration shims.
14. Two Wet-Film Thickness Gages, Prong Type, capable of measuring 25 µm to 125 µm in 25 µm increments.
15. Psychrometer and US Weather Bureau Psychrometric Tables.
16. Profile micrometer with extra coarse replica tape.

All equipment will be returned to the Contractor upon completion of the work.

574-3 CONSTRUCTION DETAILS. Overcoating is defined as spot cleaning and priming corroded areas followed by applying two coats of paint to all existing painted steel surfaces. Localized cleaning and painting is defined by spot cleaning and applying three coats of paint to spot-cleaned steel only.

The Contractor shall provide adequate access, suitable lighting, and time for inspections to be made. Any work done while the Engineer has been denied, or restricted from access, shall be recleaned and repainted at no additional cost to the State.

574-3.01 Quality Control Plan. The Contractor shall provide the Engineer a copy of the Contractor's Quality Control (QC) procedures and/or Quality Control Plan (QCP). The QCP describes the minimum QC activities that will be performed by Contractor's QC personnel to ensure compliance. The QCP shall minimally include operating procedures and maintenance records for equipment on site, proof of formal QC training for the Contractor's QC personnel on site, and daily reports including the following information:

- Compressed Air Cleanliness
- Dry-Film Thickness
- Air Temperature
- Humidity and Dew Point
- Surface Temperature
- Abrasive Cleanliness Checks
- Degree of Cleanliness Achieved
- Surface Profile
- Batch Numbers of Paint Used
- Batch Numbers of Thinner Used
- Mixing According to Specification

The Contractor must provide daily reports to the Engineer upon request. The reports shall be submitted no later than 24 hours following the completion of the days work.

574-3.02 Surface Preparation for Overcoating. Steel surfaces shall be prepared for painting by a combination of pressure washing and power-tool or vacuum-shrouded blast cleaning. Pressure washing of all areas to be painted shall be performed first, followed by power-tool cleaning of areas demonstrating corrosion of the steel substrate to remove all paint, rust, rust scale, and mill scale, as per SSPC SP-11, *Power Tool Cleaning to Bare Metal* or SSPC SP-10, *Near-White Metal Blast Cleaning* as applicable. If heavy deposits of rust and scale are present, they shall be removed by hand or power tool prior to pressure washing. Areas of tightly adhered coating to remain shall be abraded to provide an anchor profile for overcoat paint. Large deposits of bird droppings shall be removed prior to pressure washing.

A. Pressure Washing and Solvent Cleaning. All steel surfaces to be painted shall be pressure washed, using an operating pressure range of 12.5 MPa to 14 MPa, a minimum flow of 13 L/minute, and a water temperature of 85°C to 93°C. The nozzle shall be held at a distance of 150 mm to 300

mm from the steel surface. Pressure washing shall only be allowed when ambient air temperatures are greater than 4.5°C and rising. In no case will pressure washing be conducted when spent wastewater could freeze on roadway or bridge surfaces or in any other way create a hazardous situation. The washing is intended to remove contaminants from the surface, not to remove tightly adhered paint. Oil and grease shall be removed by solvent cleaning as described in SSPC SP1, *Solvent Cleaning*. The areas shall be pressure washed again following this cleaning.

When the washing is completed, the cleaned surfaces shall be free of dust, dirt, oil, grease, animal waste, salts, and other debris

A containment shall be suspended around and beneath the work area during pressure washing. The containment for pressure washing is intended to capture solid paint chips and other solid debris that may become dislodged from washing operations. Unless otherwise noted, spent wash water will not require collection and will be allowed to fall to the underlying ground or waterway, provided that the other requirements of this specification are met.

Special note, Structural Painting Details, will provide scheduling requirements for washing a structure over a body of water. Spent wash water over a public water supply or the New York City watershed shall be collected and diverted to the adjoining land mass.

If steel surfaces become contaminated or 7 calendar days elapse between washing and abrasive blasting cleaning, they shall be rewashed at no additional cost to the State.

B. Power Tool Cleaning. Power tools as described in SSPC-SP 11 shall be used to clean corroded steel. Vacuum-shrouded abrasive blasting may be allowed. Steel cleaned using vacuum-shrouded blasters shall be cleaned to SSPC-SP 10.

1. Atmospheric Conditions. No cleaning operations will be conducted under the following conditions:

The relative humidity exceeds 85%.

When the substrate is damp or covered by frost.

The surface temperature is less than 3°C above the dew point.

2. Steel Cleanliness and Profile. Surfaces which have become visibly corroded shall be cleaned in accordance with SSPC-SP 11 or SSPC-SP 10, as applicable. Areas where the existing paint has peeled, flaked, blistered, or otherwise become deteriorated shall be cleaned until only sound paint, tightly adherent paint remains. These areas need not be cleaned to SP-11 or SP-10 if the damage does not extend to the steel surface and corrosion of the steel substrate or the mill scale is not evident.

Equipment used shall produce an anchor profile meeting the manufacturer's requirements as reported on the manufacturer's data sheets.

Special attention shall be given to the edges of beam flanges, angles and plates, bearings, rivets, the heads of nuts and bolts, structural steel surrounding bridge joints, and similar surfaces that are marginally accessible and difficult to clean.

The edges of intact paint shall be feathered back and the adjoining paint must be tightly adhered. Ragged or lifting edges on adjoining paint will not be allowed. Adherence will only be considered satisfactory if the adjoining paint is smoothly feathered back, and cannot be removed by lifting with a dull putty knife.

3. Vacuuming. The vacuum assembly on all tools shall be capable of containing all visible dust and debris produced by the operation of the cleaning equipment. Air passing through the vacuum assembly shall be exhausted through a HEPA filter. A HEPA filter shall be defined as a filter that is at least 99.97% efficient for particles that are 0.3 µm in diameter, or larger.

4. Preparation of Remaining Coating. Areas exhibiting damaged or deteriorated paint not extending to the steel shall be power-tool cleaned to remove all damaged or loosely adhered paint

and provide a suitable surface for top coating. Loosely adhered paint will lift when scraped with a dull putty knife.

After cleaning and feathering edges, all remaining tightly adhered coating shall be abraded. The abrading operation shall not fracture or remove a significant amount of existing coating, only provide surface profile suitable to receive additional coats of paint. The degree of abrasion shall be in accordance with the manufacturer's recommendations.

The Contractor shall choose the method of abrasion. No additional payment will be made for the appropriate containment and waste collection required to abrade the surface. Open abrasive blasting to abrade the surface shall require a Class A containment, in accordance with Section 570 *Paint Removal Operations*. All other methods of abrasion shall minimally require the same level of containment as specified in contract documents for a particular structure.

If the Contractor chooses a wet-abrasive method for abrasion, the containment must meet the requirements of SSPC – Guide 6, Class 2W. All water and abrasive must be collected and disposed of as hazardous waste.

All dust, powder, or residual abrasive remaining on the surface after the abrading operation shall be thoroughly removed and the remaining surface clean prior to painting.

5. Cleaning Area. The area cleaned shall be limited to that which can be cleaned, inspected and prime coated within a 10 hour period. Cleaned areas shall be inspected by the Engineer prior to priming. Areas that exhibit flash rusting within the 10-hour period or fail to meet the project cleaning standard prior to painting shall be recleaned.

C. Visual and Project Standards. The Contractor shall prepare at least one project cleaning standard for each representative area on the structure that is being prepared for painting. Multiple standards may be required if the cleaned steel differs significantly from the photographic standards due to surface conditions, location from work area, or other factors such as distance of the standard from the work area.

The prepared standard shall generally conform to SSPC VIS 3, *Visual Standard for Power- and Hand-Tool Cleaned Steel*, and shall be approved by the Engineer before the start of general cleaning work. Each cleaning standard shall be at least 300 mm x 300 mm in size, and shall be located in an area of the structure that is accessible to, and approved by the Engineer. The Contractor shall protect the cleaning standard from corrosion and contamination throughout the duration of work by applying a clear coat of polyurethane. At the completion of cleaning work, the project standard shall be recleaned and painted. If the project cleaning standard becomes deteriorated, or otherwise ineffective, it shall be reestablished at no additional cost to the State. Corroded and deteriorated surfaces that have been cleaned using power tools shall be accepted by visual comparison to the project prepared standard(s) for each structure. In case of a dispute over the visual standard, the written standard shall take precedence.

574-3.03 Surface Preparation for Localized Cleaning and Painting. All of the requirements of §574-3.02 shall apply with the exception of abrading the remaining coating. Only tightly adherent existing coating within 150 mm of a power tool cleaned surface shall be abraded.

574-3.04 Overcoat Painting. The paint shall appear on the Department's Approved List, 'Structural Steel Paints – Class 2' and be approved for overcoating application.

The Contractor shall apply each coat of paint in the order listed on the Department's Approved List 'Structural Steel Paints – Class 2.'

A. Atmospheric Conditions. Paint shall not be applied when the receiving surface and ambient temperatures are less than 5°C or greater than 38°C, unless the manufacturer's recommendations for

temperature are more restrictive. No paint shall be applied unless the receiving surface is absolutely dry.

Paint shall not be applied when the relative humidity is more than 95% unless the paint manufacturer's requirements are more restrictive. No paint shall be applied during rain.

The Contractor shall observe the dew point restrictions listed on the manufacturer's data sheets.

If an epoxy coating is exposed to cold temperatures or humid conditions outside of the manufacturer's recommended values prior to cure, the surface shall be visually examined for greased or oily surfaces which may have formed. The Engineer may also require the Contractor to use a commercially available amine blush test kit in various locations. If testing indicates the presence of an amine blush or if there is any oily film on the surface, the surfaces shall be cleaned in accordance with paint manufacturer's recommendations at no additional cost to the State.

B. Paint Mixing. All paint shall be thoroughly mixed with mechanical mixers in accordance with the manufacturer's recommendations. After mixing the bottom of the container shall have no unmixed pigment.

C. Solvents and Thinners. Paint may be thinned if recommended by the manufacturer and approved by the Engineer. The primer, if classified as metallic pigmented, shall not be thinned such that the resulting VOC exceeds 500 g/L. The subsequent coats of paints shall not be thinned such that the resulting VOC level exceeds 340 g/L.

Use of unauthorized thinners, or using excess amounts of thinners is prohibited. Any area where unauthorized solvents or thinners are used shall be recleaned and repainted at no additional cost to the State. All thinning shall be performed in the presence of the Engineer.

D. Paint Application. Painting shall not begin until cleaned surfaces have been inspected and approved by the Engineer. Paint may be applied using spray, brush, or roller, unless otherwise indicated by the contract documents or prohibited by the paint manufacturer. All paint shall be applied so as to produce a uniform, even coating, free of runs, sags, drips, ridges or other defects. Roller nap shall be limited in accordance with the paint manufacturer's recommendation. Areas exhibiting trapped fiber or bristles shall be rejected. Prepared areas that exhibited damaged paint not extending to the steel substrate shall receive two coats of paint : intermediate and finish coat.

Complete protection against paint spatter, spillage, wind-blown paint, or similar releases of paint shall be provided. Covers, tarps, mesh, and similar materials shall be placed around the work area to protect public and private property, pedestrian, vehicular, marine, or other traffic, all portions of the bridge, highway appurtenances, waterways, and similar surrounding areas and property, upon, beneath, or adjacent to the structure. The use of spray equipment for paint application shall be allowed within containments provided that the aforementioned protection against paint release is provided, all equipment used (including tarps, mesh and similar materials) meets all safety requirements for such enclosed use with paint spraying, and all OSHA requirements for safety and ventilation are met.

E. Paint Film Thickness. Paint shall be applied to produce the specified dry-film thickness (DFT) as directed by the range listed on the paint manufacturer's data sheets. The dry-film thickness shall be determined in accordance with SSPC-PA 2, Paint Application Specification No. 2 - *Measurement of Dry Film Thickness with Magnetic Gages*, using a Type 2, fixed-probe magnetic gages. Dry-film thickness gauges shall be calibrated over a cleaned, approved surface.

DFTs of the all coats applied subsequent to the primer shall be determined by subtracting the average DFT readings of the previous coat(s) from the actual DFT readings. An average DFT value shall minimally be recorded and calculated for every 100 m² prepared. The average shall be calculated using a minimum of 5 spot measurements as defined by SSPC-PA2.

Areas failing to meet the specified minimum dry-film thickness shall be top coated with the same paint to produce the total dry film thickness required. The top coating must be performed within the paint manufacturer's specified recoat window.

The Engineer may require any area exceeding the manufacturers recommended dry film thickness to be cleaned to the SSPC-SP 11 or SSPC-SP 10 condition.

F. Painting Schedule. Primer shall be applied as per §574-3.02, B.5 of this specification.

The second coat shall be applied within 72 hours of the final cleaning operation.

To prevent intercoat adhesion failure, recoating must be performed within the manufacturer's recommended recoat window, or 14 days, whichever is shorter. If the contractor fails to recoat within the specified time period, the surface to be painted shall be cleaned and abraded in accordance with manufacturer's recommendations. This work shall be done at no additional cost to the State.

If the steel has become dirty between coats, the Contractor shall wash the bridge again at no additional cost to the State.

574-3.05 Painting for Localized Cleaning and Painting. The paint shall appear on the Department's Approved List, 'Structural Steel Paints - Class 2' and be approved for localized application.

The Contractor shall apply each coat of paint in the order listed on the Department's Approved List "Structural Steel Paints - Class 2".

All of the requirements of §574-3.04 shall apply with the exception of area painted. Only areas that have been cleaned shall be painted. Paint shall not extend more than 150 mm beyond all power-cleaned areas.

574-4 METHOD OF MEASUREMENT

574-4.01 Overcoating - Lump Sum. The work under this item will be measured on a lump sum basis, per structure.

574-4.02 Overcoating - Square Meter. The measurement of this item will include the area requiring overcoating, measured to the nearest whole square meter.

574-4.03 Localized - Square Meter. The quantity to be measured will be in square meters of area of steel cleaned and painted, measured the nearest whole square meter.

574-5 BASIS OF PAYMENT

The lump sum price bid shall include the cost of all labor, materials, and equipment necessary to complete the work, including the cost of providing protection against damage to public and private property during pressure washing and paint application. Payment for the containment, collection and disposal of dust and paint waste generated by surface preparation work shall be paid for separately.

Progress payments will be based on the percentage of steel cleaned and painted. 60% of the quantity will be paid for surface preparation and priming. The remaining amount will be paid following the satisfactory completion of work.

Payment will be made under:

Item No.	Item	Pay Unit
574.01nn	Structural Steel Painting: Overcoating	Lump Sum
574.02nn	Structural Steel Painting: Overcoating	Square Meter
574.03nn	Structural Steel Painting: Localized	Square Meter

NOTE: nn denotes a serialized pay item."

Page 5-140 After line 30 Add the following:
"SECTION 575 (VACANT)"

§ 586-2.02

Page 5-169 Delete lines 29 through 31 and Replace with the following:
"If paint color is not specified, the color selected shall match the existing paint. Paint shall be selected from the Department's Approved List for Structural Steel Paint – Class 2."

§ 586-3.03

Page 5-170 Delete line 23 and Replace with the following:
"requirements of Section 574 *Structural Steel Painting: Localized*. In cases where the Contractor can clearly demonstrate through"

Page 5-171 Delete line 5 and Replace with the following:
"Painting shall be done in accordance with the requirements of Section 574 *Structural Steel Painting: Localized*. All steel"

§ 589-3.01

Page 5-175 Delete line 4 and Replace with the following:
"requirements of Section 574. In cases where the Contractor can clearly demonstrate through exposure"

Make the following changes to Volume 3 of 3 of the Standard Specifications of January 2, 2002.

Page 7-114 Delete § 710-23 F. and Replace with the following:
"F. **Painting Rustic Railing**. When paint is used to obtain a rustic appearance, all components of the railing system shall be galvanized and then the visible portions of the system shall be painted in accordance with §657 Painting Aluminum and Galvanized Surfaces. Paint shall be 'Weathered Brown' color as defined by 708-05 Standard Paint Colors."

§ 716-11

Page 7-188 Delete lines 37 through 45 and Replace with the following:
"All surfaces shall be cleaned and painted in accordance with Section 572, Structural Steel Paint System, Shop Applied. Color shall match that of the finish coat of other structural steel. For bearings used in conjunction with unpainted steel, the finish coat shall match 'Weathered Brown' color as defined by 708-05."

Section 708

Page 7-86 Add the following:

"708-01 STRUCTURAL STEEL PAINTS CLASS 1

SCOPE: This specification defines the requirements for materials appearing on the Department's Approved List, "Structural Steel Paints, Class 1."

MATERIAL REQUIREMENTS: The system shall be able to be applied as a shop or a field-applied coating over an SSPC SP-10 cleaned surface.

The primer shall be an organic zinc-rich epoxy with pigment primarily consisting of zinc dust.

The paint shall have undergone National Transportation Product Evaluation Program (NTPEP). The coating manufacturer shall submit NTPEP results, field histories of the coating, Material Safety Data Sheets, and Technical Data Sheets to the Materials Bureau. Any formulation or technical data sheet change may affect approval status, and shall be reported to the Materials Bureau. Failure to notify the Materials Bureau shall result in the removal of the system from the Approved list.

The system's Technical Data Sheets shall contain the following information;

- Temperature Range for Storage
- Profile Range
- Temperature for Application
- Cure to Handle/Overcoat Schedule
- Humidity and Dew Point Restrictions
- Mixing Recommendations
- Thinners allowed and resulting VOC levels
- Recoat Window
- Paint Film Thickness Range, Wet and Dry-Film Values
- Surface preparation requirements
- Application Requirements

If the data sheet does not have all of the above information, the manufacturer will be required to submit a letter to the Engineer with the above information. The letter will be considered an addendum to the technical data sheet.

BASIS OF ACCEPTANCE: Contract acceptance will be based on the appearance of the product on the Approved List.

708-02 STRUCTURAL STEEL PAINTS CLASS 2

SCOPE: This specification defines the requirements for materials appearing on the Department's Approved List, "Structural Steel Paints, Class 2."

MATERIAL REQUIREMENTS: The system shall be able to be applied in the field over an SSPC SP-11 cleaned surface or a previously painted surface.

The paint shall have undergone National Transportation Product Evaluation Program (NTPEP) or NYSDOT approved alternative testing. The coating manufacturer shall submit NTPEP results and field histories of the coating to the Materials Bureau.

Any formulation or technical data sheet change may affect approval status and shall be reported to the Materials Bureau. Failure to notify the Materials Bureau shall result in the removal of the system from the Approved list.

The system's Technical Data Sheets shall contain the following information:

- Temperature Range for Storage
- Profile Range
- Temperature for Application
- Cure to Handle/Overcoat Schedule
- Humidity and Dew Point Restrictions

- Mixing Recommendations
- Thinners Allowed and Resulting VOC Levels
- Recoat Window
- Paint Film Thickness Range
- Surface Preparation Requirements
- Application Requirements

If the data sheet does not have all of the above information, the manufacturer will be required to submit a letter to the Engineer with the above information. The letter will be considered an addendum to the technical data sheet.

BASIS OF ACCEPTANCE: Contract acceptance will be based on the appearance of the product on the Approved List. “

Page 7-88 After line 20 Add the following:
“SECTION 708-03 (VACANT)”

***** DESIGNER NOTE:**

The designer does not have to use this particular format for the special note, "Structural Painting Details". All information required by the specification should be included in the note. Designers should check with Regional environmental personnel for the classification of all bodies of water in question.

"Structural Painting Details"

Unless otherwise noted, the finish color shall be Munsell 7.5 GY 5/4

Structure #	BIN	Containment Items	Painting Items	Structure Length	Structure Width	Vertical Clearance	Structure Over Public Water Supply or NYC Watershed	Stream Classification
01	100450	570.150001	573.010001	75	20	8	No	C(TS)
<p>REMARKS: State Route A over the Waterkill river. Structure can only be washed between the dates of May 1st and June 30st.</p>								
02	101356	570.150002	573.010002	75	20	10	No	None
<p>REMARKS: State Route B over bike path.</p>								
03	102259	570.090003	574.030003	60	12	10	No	None
<p>REMARKS: Interstate A over County Route A. Localized painting near primarily near bearings. Painting to include railings.</p>								
04	102280	570.160004	574.020004 574.030004	35	12	9	No	None
<p>REMARKS: State Route C over Interstate C. The fascia beams will be painted in accordance with 574.02(Overcoating). All areas to be cleaned and painted on interior beams shall be painted in accordance with 574.03(Localized). The finish coat color shall be Federal Color 20059</p>								
05	105598	570.150005	573.010005	50	15	8	Yes	None
06	105599	570.150006	573.010006	50	15	8	Yes	None
<p>REMARKS: State Route D over the Waterville reservoir. Structures 5 and 6 are located over a public water supply and all wash water must be collected and diverted to the adjoining land mass.</p>								

NOTE: Physical dimensions of the structure are approximated. Contractors should not prepare estimates based solely on these figures.