

**ITEM 573.1018nn91 - FIELD CLEANING AND PAINTING - TOTAL REMOVAL (SP10) USING BLASTOX**

**ITEM 573.1019nn91 - FIELD CLEANING AND PAINTING - TOTAL REMOVAL (SP10) USING BLASTOX (SPRAY PROHIBITED)**

**DESCRIPTION**

This work shall consist of pressure washing, abrasive blast cleaning to remove all paint, rust, millscale, and other corrosion producing contaminants, and painting structural steel surfaces with three (3) full coats of new paint, where indicated by the Contract Documents.

**MATERIALS**

1. **Paint and Thinner.** Paint and thinner shall be selected from the Department's Approved List, "Moisture-Curing Urethane Paint Systems". No substitutions will be allowed.

The shelf life of all paint shall be a maximum of 12 months from the date of manufacture. All acceptances of paint shall expire within 12 months from the date of manufacture.

All paint (primer, intermediate, and finish coats) used on any one structure shall be produced by the same manufacturer.

Each single coat of paint shall be a color different from the others. The color of the primer and the intermediate paints shall be at the Contractor's option, and shall provide contrast with the underlying substrate. The color of the finish paint shall be as specified in the Contract Documents, or as ordered by the Engineer.

2. **Water for Washing.** Water for pressure washing shall be clean, fresh water. Cleaners, detergents, or other additives will not be allowed. Salt water will not be allowed.

3. **Abrasive for Blast Cleaning.** Abrasive used for blasting shall be a mineral abrasive (such as slag) pre-blended with Blastox® abrasive additive, manufactured by the TDJ Group, Inc. The Blastox® additive shall be blended at no less than fifteen percent (15%) by weight, with the final add rate per the manufacturer's recommendation. The Blastox® additive shall be used in accordance with all manufacturer's technical information, including Technical Data Sheet, MSDS, all Technical Bulletins and Sales Bulletins. The abrasive shall be kept dry until use and show no signs of solidifying.

In addition, the Blastox® additive shall have the following characteristics:

- Particle size distribution of at least 95% >50 mesh and <12 mesh
- Bulk density of >80 pounds per cubic foot and < 100 pounds per cubic foot.
- Hardness >6.0 on the Mohs Scale
- Must be capable of rendering leachable lead in the untreated spent abrasive wastes from up to 100 mg/l to less than 5.0 mg/l (non-hazardous) according to the TCLP
- Not be regulated under Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA (Superfund Act and Reauthorization Amendments) Title III.
- Not contain any steel or iron based material, such as but not limited to grit, shot, fines, or filings

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due to the EPA ban on this activity as impermissible dilution of a hazardous waste (Federal Register: May 26, 1998, Volume 63, Number 100, pages 28566-28569).

- Possess a letter from the State Environmental Department, indicating product can be used without RCRA (or equivalent) treatment permits.
- Contain less than 0.1% soluble salts (e.g. flourides and chlorides).

All abrasive shall be free of lead and corrosion producing contaminants. The abrasive selected for use shall be designed to leave a profile of approximately 40  $\mu\text{m}$  to 65  $\mu\text{m}$  in a dense, uniform pattern of depressions and ridges. Silica sand and other types of non-metallic abrasive containing more than 1.0% crystalline (free) silica, by weight, will not be allowed.

4. **Basis of Acceptance.** All primer, intermediate, and finish paint and thinner material, shall be accepted on the basis of the manufacturer's name, and the product name, appearing on the Department's Approved List.

Water for washing and abrasive material for blast cleaning shall be approved by the Engineer.

Only paint and thinner arriving at the work site in new, unopened containers shall be used.

Containers of paint shall be labeled with the manufacturer's name, product name, batch number, and date of manufacture. Paint that has not been used within 12 months from the date of manufacture shall be removed from the work site.

The abrasive shall arrive in containers explicitly labeled as Blastox®-blended abrasive, or accompanied with a bill of lading or similar document demonstrating the incorporation and add rate of Blastox®.

**CONSTRUCTION DETAILS**

All structural steel members, railings, downspouts, and other miscellaneous steel items as indicated by the Contract Documents shall be cleaned of all paint, rust, millscale, and corrosion producing products and then painted with three (3) full coats of new paint (the primer coat, the intermediate coat, and the finish coat).

1. **Surface Preparation.** Steel surfaces shall be prepared for painting by a combination of pressure washing and abrasive blast cleaning.

Pressure washing to remove dirt and debris shall be performed first. Abrasive blast cleaning to remove all paint, rust, and millscale shall be performed second.

- a. **Pressure Washing.** All steel surfaces to be painted shall first be pressure washed, using equipment operating at a minimum pressure of 21.5 MPa, and with a minimum flow of 9.5

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L/minute. The pressure washer shall be operated at a distance of 150 mm to 300 mm from the steel surface. Water may be heated. After washing, the surface shall be allowed to dry before subsequent abrasive blast cleaning work is done.

Pressure washing shall be performed to remove dirt, dust, animal waste, and water soluble contaminants. Clean, fresh water shall be used with sufficient pressure to remove surface contaminants and loose material. Hand scraping and hand scrubbing with a stiff bristled brush will be required as necessary to remove debris. When necessary, oil and grease shall be removed by hand-wiping, using solvents.

After pressure washing, the cleaned surfaces shall be visually free of dust, dirt, oil and grease, animal waste, salts, and other debris.

Pressure washing will only be allowed when ambient air temperatures are greater than 4.5°C and rising. In no case shall pressure washing be performed when in the opinion of the Engineer spent wastewater will freeze on roadway or bridge surfaces, or in any other way create a hazardous situation.

During washing operations, a containment shall be suspended around and beneath the work area to contain all paint chips, corrosion residue, and other solid particles that become dislodged by pressure washing (see *Note*<sup>1</sup>). All such solid residue shall be contained, collected, and allowed to air dry for treatment and disposal as hazardous paint removal waste under Item 571.01 M, as directed by the Engineer. The containment provided shall also prevent all spray and residue from falling on or interfering with traffic, pedestrians, or surrounding property, above or below the structure. Extreme care shall be exercised to ensure that vehicles, pedestrians, and property are not exposed to the cleaning process.

All structures over water courses shall be washed during the seasonal periods indicated in the Contract Documents. If no schedule is provided, washing shall occur only when adequate flow exists in the stream to dilute possible contaminants. Operations shall be sequenced so as to clean structures over small bodies of water or small streams in the spring of the year, or in a period when flows are greatest. Streams categorized by the NYS Department of Environmental Conservation (DEC) as "CT(s)", i.e., trout spawning, shall be washed prior to July 1 and bridges located at DEC yearling trout stocking sites shall not be washed during April. When washing operations are performed on bridges over a public water supply, e.g., reservoir, or on bridges in the watershed area of New York City water supply, the spent

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<sup>1</sup>**Note:** The containment for pressure washing is intended to capture solid paint chips and other solid debris that may become dislodged from washing operations. The containment may be constructed of water-permeable or water-impermeable materials. Spent washwater will not require collection and will be allowed to fall to the underlying road, ground, or waterway, providing the other requirements of this specification are met. The exception for the collection of spent washwater will be for structures over a public water supply. When a bridge crosses a public water supply, the spent washwater must be diverted or collected and disposed of on the adjoining land mass, at a location away from the water's edge.

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washwater shall be diverted, or collected, and disposed of on the adjoining land mass, at a location away from the water's edge.

To minimize contamination of the washed surfaces, subsequent cleaning, priming and painting work shall be performed within 14 calendar days of the completion of washing work. If more than 14 days pass by or if the steel surfaces become dirty, they shall be rewashed in accordance with this specification, at no additional cost.

b. Near White Blast Cleaning

All surfaces shall have all paint, rust and rust scale, mill scale, and other corrosion producing contaminants removed by abrasive blast cleaning to SSPC-SP 10, Near White Blast Cleaning.

The surface of the area blast cleaned in any one day shall be no greater than the surface area of steel that can be prime coated in the same working day.

All equipment and compressors used in the cleaning operation shall be equipped with all necessary filters and traps to prevent moisture, oil, and other contaminants from being deposited on clean surfaces.

If recyclable abrasive are used they shall be cleaned of all paint, chips, rust, millscale and other foreign material after each use, and prior to reuse. All equipment used for cleaning abrasive shall be specifically designed for this purpose, and approved by the Engineer.

Special attention shall be given to the edges of beam flanges, angles and plates, bearings, rivets, the heads of nuts and bolts, and similar surfaces that are marginally accessible and difficult to clean. These surfaces are often difficult to access, and are labor intensive and hard to clean. To remove heavy deposits of rust and scale, hand pounding using a hammer, or power tool cleaning using a needle gun or de-scaler may be necessary before abrasive blast cleaning work begins.

All fin, 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 40  $\mu\text{m}$  to 65  $\mu\text{m}$  deep anchor profile.

Throughout abrasive blast cleaning work, care shall be taken to protect newly painted surfaces from the cleaning operations. Tarps, covers, or other devices approved by the Engineer shall be used to protect new paint from damage. Damaged paint shall be thoroughly wire brushed or if visible damage occurs, reblasted to the required condition, and

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then repainted. All repair to damaged paint surfaces shall be approved by the Engineer.

After cleaning operations are completed, all residue 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 removal of particles that are 0.3  $\mu\text{m}$  in diameter, or larger.

Corroded and deteriorated surfaces that have been cleaned to SP-10 by abrasive blasting shall be accepted by visual comparison to a project-prepared standard(s) for each structure. The Contractor shall prepare a project standard by abrasive blast cleaning a representative area on the structure that is being prepared for painting. The prepared standard shall generally conform to SSPC VIS 1-02, "Guide and Reference Photographs for Steel Surfaces Prepared By Dry Abrasive Blast Cleaning" Pictorial Standard A SP-10, B SP-10, C SP-10, D SP-10, G1 SP-10, G2 SP-10, or G3 SP-10 as applicable, and shall be approved by the Engineer before the start of general cleaning work. At least one standard shall be prepared for each structure that is being specified for cleaning. More than one standard may be necessary if the cleaned steel differs significantly from the photographic standards due to surface conditions or other factors. Each 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 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 project standard shall be recleaned and painted in accordance with this specification. If in the opinion of the Engineer the project standard becomes deteriorated, or otherwise ineffective, it shall be reestablished in accordance with this specification at no additional cost.

2. **Painting.** Painting shall consist of striping and then applying three full coats of new paint to all surfaces cleaned to SP-10. The first full coat shall be primer, followed by the application of a full coat of intermediate paint, and a full coat of finish paint, to all steel surfaces designated to be painted.
  - a. **Material Storage.** Paint in storage shall be protected from damage and maintained between 4.5°C and 29.5°C.
  - b. **Specifications and Inspection Equipment.** Prior to the start of and throughout the duration of work, the Contractor shall supply the Engineer with the following specifications and equipment. *No work shall begin until these materials have been delivered to, and accepted by the Engineer.*
    1. One bound copy of the Steel Structures Painting Council surface preparation specification, SSPC-SP 10 Near White Blast Cleaning.

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2. One bound each of the Steel Structures Painting Council VIS 1-02, "Guide and Reference Photographs for Steel Surfaces Prepared By Dry Abrasive Blast Cleaning" Pictorial Standard.
  3. 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.
  4. One Air Thermometer, pocket type, -10°C to +40°C.
  5. One Surface Thermometer, -10°C to +40°C.
  6. One Magnetic Dry Film Thickness Gage, Type 2 (fixed probe), with a digital readout display capable of measuring 1 μm to 1500 μm in 1 μm increments.
  7. Two Wet-Film Thickness Gages, Prong Type, capable of measuring 25 μm to 125 μm in 25 μm increments.
- c. Atmospheric Conditions. No paint shall be applied when the receiving surface and ambient temperatures are less than 1.5°C or greater than 38°C. No paint shall be applied unless the receiving surface is absolutely dry, but there will be no restriction for humidity or dew-point temperature differential..

In general, no paint shall be applied in the months of December, January, February, or March. If the Contractor requests approval to apply paint in winter months, and if in the Engineer's opinion satisfactory results can be achieved, then the substrate shall be enclosed, painted under cover, and protected from the surrounding air. The interior of the enclosure shall be heated and the steel painted when the surface temperature is 10°C or greater. Direct application of heat to the steel surface will not be allowed. The painted steel shall remain enclosed and heated for a minimum of eight hours, or until the applied coating is dry, whichever is longer. No additional payment will be made for the cost of enclosing, heating and protecting paint that has been applied in conditions of cool weather.

When painting inside an enclosure, adequate mechanical ventilation shall be supplied to meet OSHA regulations for worker exposure to solvents, fumes, lead and other provisions. When mechanical ventilation is provided, filtration of the exit air will not be required. No additional payment will be made for the cost of ventilation.

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- d. Mixing Paint. 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.
- e. Solvents and Thinners. Paint may be thinned if recommended by the manufacturer and only if approved by the Engineer. Only approved thinner shall be used and added up to a maximum of 60 ml/L.

Thinning shall be performed by pouring one-half of the thoroughly mixed paint into a empty, clean container. The required thinner is then added to one of the half-size portions, and the two portions are remixed to obtain a homogenous mixture.

The paints specified for this work have a limited pot life because of their reaction with the moisture in the atmosphere. The paint will gel when it nears the end of its pot life. Thinning to reduce the viscosity of gelled paint will not be allowed. The pot life of this paint can be extended by covering open containers to reduce exposure to moisture and by keeping containers of paint cool.

Unauthorized use of solvents and thinners shall result in recleaning and repainting of the surface in accordance with this specification, at the Contractors expense.

- f. Paint Application. No painting shall begin until cleaned surfaces have been inspected and approved by the Engineer. The Contractor shall provide safe, stable, and direct access to the work area for the Engineer's inspection

Paint may be applied using brush, roller, or spray methods, unless spray painting is prohibited by the Contract Documents. When spray painting is prohibited, paint shall be applied using brushes or rollers only. All paint shall be applied so as to produce a uniform, even coating free of runs, sags, drips, ridges, or other defects.

To ensure adequate paint film thickness, stripe painting using primer shall be required on the following surfaces: all welds, rivets, bolts, nuts, and edges of plates, angles, bearings, lattice pieces or other shapes, and corners and crevices. To provide contrast, paint for stripe coating shall be a color that is different than the color of the receiving surface. The stripe coat may be applied before or after the first full coat of primer is applied. Such striping shall extend a minimum of 25 mm from the edge. To prevent removal of the stripe paint by the following coat of paint, the stripe coat shall be allowed to set-to-touch before the next paint coat is applied. However, on cleaned surfaces the stripe coat shall not be permitted to dry for a

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period long enough to allow rusting of the unprimed steel.

Complete protection against paint spatter, spillage, overspray, 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.

- g. Paint Film Thickness. Paint shall be applied in such a quantity so as to produce the minimum specified dry film thickness for the type of paint material being used (see Approved List - Moisture-Curing Urethane Paint Systems).

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 gage, equipped with a digital readout display.

Areas failing to meet the specified minimum dry film thickness shall be overcoated with the same type of paint to produce at least the total dry film thickness required.

- h. Painting Schedule. Primer shall be applied to cleaned surfaces within twelve hours of the cleaning operation and before visible rust appears on the cleaned surface. Failure to apply primer to a cleaned surface within twelve hours or before the appearance of visible rust shall result in recleaning the surface in accordance with this specification, at no additional cost.

All coats of paint shall be overcoated with the subsequent coat in accordance with the time period specified for the paint material that is being used (see Approved List - Moisture-Curing Urethane Paint Systems). To prevent intercoat adhesion failure, recoating with the next coat of primer, intermediate, and finish paint, must be performed within the maximum specified time period, or 14 days, whichever is shorter. If the Contractor fails to recoat within the specified time period the surface to be painted shall be recleaned by abrasive blast cleaning to SP-10, and repainted in accordance with this specification, at the Contractor's expense.

**METHOD OF MEASUREMENT**

Payment shall be made by the lump sum price bid.

**BASIS OF PAYMENT**

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The lump sum price bid shall include the cost of all labor, materials, and equipment necessary to complete the work. The cost of providing protection against damage during pressure washing and paint application shall be included in the bid price. Payment for the containment and disposal of dust and paint waste generated by surface preparation work will be paid for under other items, however, payment for the accumulation of paint removal waste for deposition in the paint removal containers shall be included in this item. Progress payments will be made based on the percentage of the structure cleaned and primed and painted with two full coats of paint in accordance with this specification.

Payment will be made under:

<b>Item No.</b>	<b>Item</b>	<b>Pay Unit</b>
573.1018nn91	Field Cleaning and Painting - Total Removal (SP10) Using Blastox	Lump Sum (for each structure)
573.1019nn91	Field Cleaning and Painting - Total Removal (SP10) - Using Blastox (Spray Prohibited)	Lump Sum (for each structure)

Note: nn denotes serialized pay item.