

INSTRUCTIONS FOR THE DESIGNER RE: PAINT SPECIAL PROVISIONS

Special Provisions have various OWNERS that MUST BE CONTACTED; those marked with ** are NOT on the Owned Special Provisions webpage but are OWNED by the Environmental Compliance Unit**

Note: During the design phase, projects with activities impacting a painted surface (drilling, scraping, sanding, bolting or unbolting, welding, abrasive blasting, rivet busting, burning, torch cutting, etc.) shall be sent to Environmental Compliance for review, similar to the current requests for contaminated soil and groundwater screenings. Since coatings other than “lead based paint” can contain measurable amounts of lead, all impacts to painted surfaces need to be screened. Where practical, Environmental Compliance will collect samples in order to confirm the presence of lead-containing paint and disposal requirements. The necessary compliance/disposal specifications will be identified and prepared by Environmental Compliance for inclusion into the project. Contact: Gregory Dorosh 860-594-3404, email- Gregory.Dorosh@ct.gov

FULL BRIDGE BLAST CLEAN/REPAINTING PROJECT

- 06039XXA - Abrasive Blast Cleaning and Field Painting of Structure (Site No. X) [LS payment, for painting entire structure, 3 Coat System] - Refer to Master Bid List for Item Nos.
- 0603XXXA - Class 1 Containment & Collection of Surface Preparation Debris (Site No. X) [LS payment] - Refer to Master Bid List for Item Nos.
- **0603222A - Disposal of Lead Debris from Abrasive Blast Cleaning** [haz disposal]
- **0020904A - Lead Compliance for Abrasive Blast Cleaning** [incl non-haz disposal]

BEAM END REPAIR PROJECT USING ABRASIVE BLAST CLEANING

This is the preferred set of provisions for beam end projects. Please discuss other options including Nonabrasive blast cleaning with Robert Obey, 860-823-3249, email- Robert.Obey@ct.gov

- 0603479A to 0603493A- Abrasive Blast Cleaning and Field Painting of Beam Ends (Site No. 1 to Site No. 15) [LS payment, for painting beam ends along a bearing line at select abutments and piers, 2 Coat System]
- 0603XXXA - Class 1 Containment & Collection of Surface Preparation Debris (Site No. X) [LS payment] - Refer to Master Bid List for Item Nos.
- **0603222A - Disposal of Lead Debris from Abrasive Blast Cleaning** [haz disposal]
- **0020904A - Lead Compliance for Abrasive Blast Cleaning** [incl non-haz disposal]

BEAM END REPAIR PROJECT NOT USING ABRASIVE BLAST CLEANING (needle gun, etc.)

Only to be used if approved by the Office of Construction- Robert Obey contact person

- 0603681A to 0603695A - Localized Paint Removal & Field Painting of Beam Ends (Site No. 1 to Site No. 15) [includes disposal; Lump Sum payment for well-defined areas related to beam end work]
- 0603729A - Localized Paint Removal & Field Painting of Existing Steel [can be tailored to include haz & non-haz disposal; S.F. payment for areas other than beam end work]
- **0020903A - Lead Compliance for Miscellaneous Exterior Tasks** [incl haz & non-haz disposal if not included above]

MISCELLANEOUS REPAIR PROJECTS (i.e. sign repairs, misc. structural repairs outside of other defined limits)

- 0603729A - Localized Paint Removal & Field Painting of Existing Steel [includes disposal, but if lead present designer must include items below and delete the “disposal” language in the Basis of Payment section; S.F. payment]
- **0020903A - Lead Compliance for Miscellaneous Exterior Tasks** [including haz & non-haz disposal if not included above or above item not used, e.g. guiderail or sign work]
- **0202317A - Disposal of Hazardous Materials** [if haz disposal is large amount; Environmental Compliance to review scope]

BRIDGE DEMOLITION

- 0503XXXA - Removal of Superstructure (Site No. X) [not owned but project-specific provision; Contractor must propose demolition methods to Engineer for approval; special provision can be tailored to address lead compliance if needed and/or include haz & non-haz disposal] - Refer to Master Bid List for Item Nos.
- **0020903A - Lead Compliance for Miscellaneous Exterior Tasks** [incl haz & non-haz disposal if not included in above]
- **0202317A - Disposal of Hazardous Materials** [used only if haz disposal is large amount and not included above; Environmental Compliance to review scope]
- 0603XXX – New Bridge Structural Steel needs to be determined by Bridge Design as to whether will be weathering under standard specification or shop painted under Special Provision 603601A Structural Steel (Site No. X)

ITEM #06034XXA - ABRASIVE BLAST CLEANING AND FIELD PAINTING OF BEAM ENDS (SITE NO. X)

Comment [JLM1]: This Special Provision is OWNED by the Office of Construction - Contact Robert Obey, 860-823-3249 or email at robert.obey@ct.gov

Description: Work under this item shall consist of surface preparation and field painting of steel components with a **2-coat system** as shown on the plans, as directed by the Engineer and in accordance with these specifications.

Components to be painted include but are not limited to the following: ends of beams and girders, diaphragms and cross frames, steel fixed bearings, steel components of expansion bearings, scuppers, drainage pipes and troughs, state-owned utility conduits, structural steel utility supports, all new structural steel installed for repair purposes, and all other metal components that are an integral part of the bridge system.

Privately-owned utilities, bridge rails, stay-in-place forms, fences, elastomeric bearing pads and bronze components shall be protected from damage by surface preparation and painting operations and are not to be painted. Any damage resulting from surface preparations, containment and/or overspray from paint operations shall be repaired by the Contractor at no cost to the State.

The amount of steel to be painted under this special provision varies by bridge site, and is to be determined by the Contractor based on the information contained in the plans. Bidders shall examine the structures in this contract and shall make their own determinations as to the work involved and conditions to be encountered.

Lead paint is presumed to be present at all bridge sites and in all locations.

Submittals: A minimum of 20 calendar days before starting any surface preparation and coating application work, the painting contractor shall submit the following to the Engineer for acceptance:

1. A copy of the firm's written Quality Control Program used to control the quality of surface preparation and coating application including ambient conditions, surface cleanliness and profile, coating mixing, dry film thickness, final film continuity, etc.
2. A copy of the firm's written surface preparation and application procedures detailing the Materials and Construction Methods for both accessible and inaccessible areas. All areas are deemed accessible, except those areas specifically designated as inaccessible. The Engineer will be the sole judge in determining the exact locations of said inaccessible areas. Inaccessible areas may include: Between back to back angles, edges of top flanges of steel members in contact with concrete, and areas of visible non-removable impacted rust. Such locations designated as inaccessible shall be coated with special materials, such as penetrating sealer or equivalent, as recommended by the Manufacturer of the selected paint system (see Materials section below for paint systems). This written program must contain a

description of all the equipment that will be used for removal of laminar and stratified rust, for surface preparation, including the remediation of soluble salts, and for paint mixing and application, including stripe coating. Coating repair procedures shall be included for both accessible and inaccessible areas.

3. A detailed description of the Contractor's enforcement procedures and the authority of personnel.
4. If the application of heat is proposed for coating application purposes, provide information on the heat containment and procedures that will be used, with data sheets for the equipment. Note: If heat is used for coating operations, the heat and containment must be maintained to provide the required temperatures for the duration of the cure period.
5. Containment plans (paint removal/collection of debris, surface preparation, coating applications, coating applications with heat, etc.).
6. Proof of SSPC-QP 1 qualifications and QP 2 qualifications, as applicable.
7. Coating product information, including coating manufacturer, product name, application instructions, technical data, MSDS and color chips.
8. Abrasive product information, including abrasive manufacturer, product name, technical data, and MSDS.

The Contractor shall not begin any paint removal work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the work in strict accordance with the requirements of Federal, State, or local regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Materials: The materials for the coating system for this work shall conform to the requirements of Section M.07.02 amended as follows:

The coating system shall be one of the following 2-coat systems:

1K Zinc Primer

Fast Clad Urethane, manufactured by:

Sherwin Williams
425 Benton Street
Stratford, CT 06615
(203) 377-1711
(800) 474-3794

Carbomastic 15
Carbothane 134 HS, manufactured by: Carboline
2150 Schuetz Road
St. Louis, MO 63146
(800) 848-4645

Epoxy Mastic Aluminum II
Acrolon 218 HS, manufactured by: Sherwin Williams
425 Benton Street
Stratford, CT 06615
(203) 377-1711
(800) 474-3794

Carbomastic 90
Carbothane 134 HS, manufactured by: Carboline
2150 Schuetz Road
St. Louis, MO 63146
(800) 848-4645

All materials for the complete coating system shall be furnished by the same coating material manufacturer with no subcontracted manufacturing allowed. Intermixing of materials within and between coating systems will not be permitted. Thinning of paint shall conform to the manufacturer's written recommendations. All components of the coating system and the mixed paint shall comply with the Emission Standards for Volatile Organic Compounds (VOC) stated in the Connecticut Department of Energy and Environmental Protection's Administration Regulation for the Abatement of Air Pollution, Section 22a-174-20(s).

Note: If any of the above and/or following stipulated contract specifications differ from those of the Manufacturer's recommended procedures or ranges, the more restrictive of the requirements shall be adhered to unless directed by the Engineer in writing.

The abrasive media for blast cleaning shall be recyclable steel grit.

Construction Methods:

Contractor - Subcontractor Qualifications: Contractors and subcontractors doing this work are required to be certified by the SSPC Painting Contractor Certification Program (PCCP) to QP 1 entitled "Standard Procedure for Evaluating Qualifications of Painting Contractors ("Field Application to Complex Structures"). When the work involves the disturbance of lead-containing paint, the Contractor and subcontractor are also required to be certified to SSPC-QP 2 "Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint." The certification(s) must be kept current for the duration of the work. If a Contractor's or subcontractor's certification expires, the firm will not be allowed to do any work on this item until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will

apply. In addition, if any recoat times are exceeded, the affected areas shall be abrasive blast cleaned to SSPC-SP 6 and coatings reapplied in accordance with these specifications at no additional cost to the State. At the option of the Engineer, if such a delay will adversely impact the successful and timely completion of the project, the Department may require the Contractor to engage another SSPC certified contractor to do the painting work at the prime contractor's expense.

Quality Control Inspections: The Contractor shall perform first line, in process Quality Control (QC) inspections. The Contractor shall implement a Quality Control Program accepted by the Engineer, including written daily reports, that ensures that the work accomplished complies with these specifications. Copies of these reports shall be provided daily to the Engineer. Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and containments
- Ambient conditions
- Surface preparation (solvent cleaning, hand/power tool or abrasive blast cleaning, etc.)
- Coating application (mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses, etc.)
- Final film acceptance

The personnel managing and performing the quality control program shall be NACE Certified Coating Inspector(s) (successfully completed Sessions I, II, III and Peer Review) or must be SSPC certified BCI level 2. The personnel performing the quality control tests shall be trained in the use of the quality control instruments. Documentation of training shall be provided. These personnel shall not perform surface preparation and painting.

Test Equipment and Materials: The Contractor shall furnish the following new test equipment and materials for use by the QC Inspector: Two PTC Surface Temperature Thermometers

1. Psychron 566 Psychrometer (Battery Operated) with two sets of batteries or a Bacharach Sling Psychrometer
2. U.S. Weather Bureau Psychrometric Tables
3. Hypodermic Needle Pressure Gage for nozzle pressure tests.
4. SSPC Visual Standards VIS 1, VIS 3, and/or VIS 4, as applicable.
5. Testex Spring Micrometer
6. Testex Press-O-Film Replica Tape, one roll (100 pieces) each of course and extra-coarse per bridge span.
7. Wet film thickness gage
8. PosiTest, Mikrotest or Elcometer Dry Film Thickness Gauge (FM)
9. SSPC Type 2 Dry Film Thickness Gauge per PA2
10. NIST (NBS) Calibration Standards Range: 0 – 39 mils

Quality Assurance Inspections: The Engineer may conduct Quality Assurance (QA) observations of any or all phases of the work. The presence or activity of Engineer inspections in no way relieves the Contractor of the responsibility to provide all necessary daily Quality Control

inspections of its own and to comply with all requirements of this Specification.

The Contractor shall facilitate the Engineer's inspections as required, including allowing ample time for the inspections and providing suitable lighting (50 foot candles minimum at the surface as defined later in this specification). The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit inspection and close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. The Contractor shall notify the Engineer in advance of plans to remove staging used in cleaning and painting operations in order to allow for inspection. The QA inspection will be performed with his own equipment when verifying the Contractor's test results in the field.

Safety: All Contractor activities associated with the coating work described and specified herein shall be conducted according to all applicable Federal (OSHA), State of Connecticut safety regulations and SSPC-PA Guide 3 entitled "A Guide to Safety in Paint Application."

Ambient Conditions: Surface preparation and coating application work shall only be done inside a containment enclosure as specified elsewhere in these specifications. No surface preparation or coating work shall be performed when the conditions inside the containment enclosure are as follows:

- When the relative humidity is at or above 90 percent.
- When the substrate is damp or covered by frost or ice.
- When the surface temperature or air temperature are less than 50 degrees Fahrenheit or greater than 100 degrees Fahrenheit.
- When the surface temperatures of the steel or air are less than five (5) degrees Fahrenheit above the dewpoint temperature as determined by a surface temperature thermometer and electric or sling psychrometer.

If the requirements of the coating manufacturer differ from the ranges provided above, comply with the most restrictive requirements unless directed otherwise by the Engineer in writing.

Protective Coverings: The Contractor shall protect property, pedestrians, vehicular, and other traffic upon, underneath, or near the bridge, and all portions of the bridge superstructure and substructure against abrasive blast cleaning damage or disfigurement from splatters, splashes, or spray of paint or paint materials. See the specification for "Class 1 - Containment and Collection of Surface Preparation Debris (Site No. X)." All coating overspray, drips and spills shall be contained. Maintain the integrity and security of all protective coverings and containment materials throughout the entire project.

Any paint chips, paint removal media (e.g., abrasives), coating or solvent that has escaped the Contractor's containment enclosure shall be cleaned up immediately. For bridges over water, the Contractor shall have on site a sufficient quantity of spill containment boom and pads to contain a spill. The length of containment boom on site shall be at least equal to twice the length of the active work site over the water.

Observed Steel Defects: If significant deficiencies, such as cracks or section losses, are found during cleaning or coating operations, the Contractor shall immediately notify the Engineer as to their extent. Significant deficiencies include the following:

- a) Cracks in any part of the superstructure
- b) Section loss more than 1/8" or section loss equal to or greater than 5 percent of flange thickness in the maximum moment areas (i.e. section loss in the middle one half of a single span structure).
- c) Section loss more than 1/4" or section loss equal to or greater than 25 percent of the flange thickness in other than the maximum moment areas (i.e. section loss up to quarter points of the middle one half of a single span structure).
- d) Section loss more than 1/8" or section loss equal to or greater than 33 percent of web thickness in the maximum shear areas (i.e. section loss within five feet of the bearing center line).

Heating Devices: The Contractor may use heating devices to obtain and maintain a condition within the containment enclosure that is suitable for surface preparation and painting application, up to and including the minimum time to recoat, or minimum time to dry for service or topcoat. Heating devices shall be limited to gas or oil-fired indirect air heaters in which the combustion products are discharged separately from the forced airstream to an area outside the containment enclosure. The heating devices must be configured so as not to form condensation on cold surfaces or cause rust-back and must be automatically controlled. Information describing the proposed heating devices and the proposed heating procedures shall be provided a minimum of 20 days in advance for Engineer acceptance.

Lighting Requirements: A minimum illumination level of 20 foot-candles shall be provided throughout the inside of the containment enclosure during surface preparation and coating application work. A minimum illumination level of 50 foot-candles shall be provided at the location of the specific work task and for inspection. All lighting fixtures and related connectors located inside the containment enclosure must be explosion proof and UL listed.

Material Storage: The Contractor shall provide a suitable facility for the storage of paint that complies with all Federal and State laws and regulations.

This facility shall provide protection from the elements and ensure that the paint is not subjected to temperatures outside of the more stringent of (1) the manufacturer's written recommended temperature extremes, or (2) below 40 degrees Fahrenheit or above 100 degrees Fahrenheit. If paint application takes place in conditions that require heating of the containment, then the temperature of the stored paint shall be maintained as at similar temperature. Storage of paint shall be in reasonable proximity to the painting locations. The Engineer shall be provided access to the stored paint at any time for inspection and to witness removal of the materials. The Contractor's facility for the storage of paint shall be subject to the approval of the Engineer.

Equipment: All equipment used in surface preparation and removal of debris, such as hoses, hoppers, recycling and vacuum machines that the Contractor brings to the site, shall be clean and free of any prior debris.

Spray equipment, brushes and rollers used in application of coatings shall be sized sufficiently and be in proper working order to accomplish the work according to the manufacturer's written recommendations.

Compressed Air: All compressed air sources shall have oil and moisture separators, attached and functional, and properly designed and sized. The compressed air sources shall deliver air to the blast nozzle, for blowing down the surfaces, or for conventional spray application that is free of oil and moisture and of sufficient pressure to accomplish the associated work efficiently and effectively. The tanks on the air compressor and moisture separator shall be drained at the end of each workday. The compressed air source shall produce a minimum pressure of 90 psi at the nozzle during abrasive blast cleaning.

The Contractor shall verify that the compressed air is free of moisture and oil contamination in accordance with the requirements of ASTM D4285. The tests shall be conducted at least every four hours for each compressor system in operation. Sufficient freedom from oil and moisture is confirmed if soiling or discoloration is not visible on the paper. If air contamination is evidenced, the Contractor shall change filters, clean traps, add moisture separations or filters, or make other adjustments as necessary to achieve clean, dry, air.

Test Sections: Prior to surface preparation, the Contractor shall prepare a test section(s) on each structure to be painted in a location(s) that the Engineer considers to be representative of the existing surface condition and steel type for the structure as a whole. The test section(s) shall be prepared using the same equipment, materials and procedures as the production operations. The Contractor shall prepare the test section(s) to the specified level according to the appropriate SSPC written specifications and visual standards. The written requirements of the specification prevail in the event of a conflict with the SSPC visual standards. Only after a test section area has been approved shall the Contractor proceed with surface preparation operations. The test section(s) shall cover approximately 10 square feet each. Additional compensation will not be allowed the Contractor for preparation of test sections.

For the production cleaning operations, the specifications and written definitions, the test section(s), and the SSPC visual standards shall be used in that order for determining compliance with the contractual requirements.

Surface Preparation:

1 – Laminar and Stratified Rust: All laminar and stratified rust or corrosion products that have formed on any area of the existing steel surfaces and accessible rust formed along edges of connected plates or shapes of structural steel shall be removed. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the

surface preparation or removal of rust results in nicks or gouges, the work will be suspended. The Contractor shall demonstrate that the necessary adjustments have been made to prevent a reoccurrence of the damage prior to resuming work.

2 – Commercial Blast Cleaning (SSPC-SP 6): Steel surfaces, including all new steel plates installed for structural repairs, shall be cleaned by the specified methods described in the SSPC Steel Structures Painting Manual, Volume 2 - Systems and Specifications, latest edition. The structural steel shall be abrasive blast cleaned according to SSPC-SP 6 “Commercial Blast Cleaning.” Before and after blast cleaning, all dissolvable foreign matter, such as oil, grease, and dust shall be removed by wiping or scrubbing the surface with rags or brushes wetted with solvent in accordance with the provisions SSPC-SP 1 “Solvent Cleaning.” Clean solvent and clean rags or brushes shall be used for the final wiping.

All foreign materials such as dirt, dust, rust scale, sand, bird droppings, and all materials loosened by abrasive blasting operations shall be completely removed by vacuuming before any painting operations are begun.

Following completion of the initial abrasive blast cleaning operations, the Contractor shall proceed with installation of new structural steel plates where required by the plans and as directed by the Engineer. The plates shall be delivered already coated with a zinc primer coat. After the plates have been welded in place and accepted, the new plates shall be coated with the same paint system used for the existing steel.

The cleaned surface shall be accepted by the Engineer before any painting. If the surface is determined to meet the requirements of SSPC-SP 6, painting operations can commence. The base coat shall be applied to the steel before the end of the day that preparation was performed and before the formation of any flash rusting or rerusting of the steel. Flash rusting or rerusting of the surface is unacceptable and requires additional blast cleaning prior to painting.

Failure of the Contractor to prepare and clean the surfaces to be painted according to these specifications shall be cause for rejection by the Engineer. All surfaces that are rejected shall be recleaned to the satisfaction of the Engineer according to these specifications, at no additional cost to the State.

3 – Steel Grit Abrasive Mix: The recyclable steel grit abrasive mix shall be maintained and monitored such that the final surface profile is within the range specified elsewhere in these specifications.

Before each reuse, the recyclable steel grit abrasive shall be cleaned of millscale, rust, paint, and other contaminants by an abrasive reclaimer.

On a weekly basis during blast cleaning operations, the Contractor shall verify that the recycled steel grit abrasives meet the requirements of SSPC-AB 2. If the abrasive fails the testing, all abrasive blast cleaning operations shall be suspended. The abrasive reclaimer shall be repaired and another abrasive sample will be required for testing after grit recovery and reclassification.

For test results within the acceptable limits, abrasive blast cleaning may resume. Test results outside of the acceptable limits will require additional equipment repairs or replacement at no cost to the State. If additional repairs were performed, another sample will be required for testing after grit recovery and reclassification. If the test results continue to remain outside of the acceptable limits, the Contractor shall replace the abrasive reclaimer at no cost to the State.

4 - Surface Profile: The specified height of the steel surface profile shall be according to the manufacturer's written instructions and shall be uniform. Verification of the profile height will be done with Testex Replica Tape. A surface profile correction factor will be measured according to SSPC-PA 2, Section 2.2.4 with the dry film thickness gauge.

Painting Operation:

1 - General: All coatings shall be supplied in sealed containers bearing the manufacturer's name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used. Storage, opening, mixing, thinning and application of coating materials shall be accomplished in strict accordance with the written requirements and procedures published by the respective coating material manufacturer and supplier. In the event of a conflict, the Contractor shall notify the Engineer in writing, and unless directed otherwise in writing, the requirements of this specification shall prevail. The Contractor shall always have at the project site the current copies of all material safety data sheets (MSDS), technical data, recommendations and procedures published by the coating manufacturer for the coating materials.

2 - Paint Mixing and Thinning: Thinning shall be performed only to the extent allowed by the manufacturer's written instructions, and only with the manufacturer's approved thinner. In no case shall thinning be permitted that would cause the coating to exceed the local VOC restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers in the original containers, or as directed by the manufacturer, before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. Excessive skinning or partial hardening due to improper or prolonged storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, painter's buckets, etc. overnight. It shall be stored in a covered container and remixed before use.

The Engineer reserves the right to sample field paint (individual components and/or the mixed material) and have it analyzed. If the paint does not meet the product requirements due to

excessive thinning or because of other field problems, the coating shall be removed from that section of the structure and replaced as directed by the Engineer.

3 – Methods of Application: All applicators of the specified coating material shall show proficiency on a test panel, or a portion of the structure as selected by the Engineer, to the satisfaction of the Engineer before commencing full-scale application.

The preferred method for coating application shall be by airless spray equipment. For striping and for application in areas where complex shapes or tight clearances will not allow spray application, the Contractor shall apply the coating material by appropriately designed and constructed rollers and brushes.

4 – Recoat Times: The recoat time of each coat of paint shall not deviate from the written recommendation of the manufacturer or the times specified in these specifications, complying with the most restrictive requirements unless directed otherwise by the Engineer in writing. If any individual time is exceeded, the affected areas shall be abrasive blast cleaned to SSPC-SP 6 and coatings reapplied in accordance with these specifications at no additional cost to the State.

5 – Film Continuity: All applied coatings shall exhibit no running, streaking, sagging, wrinkling, holidays, pinholes, top coat color or gloss variation, or other film defects. Failure of the Contractor to apply coatings that are free of film defects shall be cause for rejection by the Engineer. All coatings rejected shall be repaired to the satisfaction of the Engineer, at no additional cost to the State. Before doing any coating repair work, the Contractor shall submit to the Engineer for approval the procedures that will be used to repair the coating.

6 - Technical Advisor: It is mandatory that the Contractor obtain the services of a qualified technical advisor employed by the coating manufacturer. This advisor shall be familiar with the technical properties of the coating products and proper application methods. The technical advisor shall assist the Engineer and the Contractor in establishing correct application methods for the complete coating system. He/she shall be present at the work site before the opening of the material containers and shall remain at the site until the Engineer is satisfied that the Contractor's personnel have mastered the proper handling, mixing and application of the material. The Engineer may call the technical advisor back to the site if there are concerns that the Contractor is not handling, mixing or applying the material correctly.

7 - Containment Plan: For each individual site, the Contractor shall submit a plan of containment to the Engineer for acceptance. The plan shall be submitted twenty days before commencing painting operation. The minimum containment enclosure for the intermediate and top coat shall conform to the requirements of SSPC Guide 6, Class 1A and the following. Components of the containment system must be made from flame retardant materials. Tarpaulin material shall be clean and impermeable to air and water. Joints shall be fully sealed except for entryways. Entryways shall use multiple flap overlapping door tarps to minimize dust escape through the entryway. All mists or dust shall be filtered with collection equipment. For truss bridges a ceiling shall also be included.

8 - Application:

2-COAT SYSTEM:

A - Primer Coat Application: All prepared surfaces shall be cleaned by vacuuming to remove dust, remaining debris, and other surface contaminants before coating. Such surfaces shall then be sprayed, brushed or rolled within the specified abrasive blast cleaning containment enclosure before the end of the day or before any visible rust-back occurs. If rust-back occurs, affected surfaces shall be re-cleaned to the satisfaction of the Engineer according to these specifications, at no additional cost to the state. All surfaces shall receive 1 coat of the primer coat. Temperature ranges (both steel and air) shall be the more restrictive of that specified in the Manufacturer's written application instructions or between 50° F. to 100° F., unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the Manufacturer's written instructions. The primer coat shall be of a contrasting color to the topcoat color. The dry film thickness will be checked for compliance per the guidelines of SSPC-PA 2.

All plate and shape edges, plate seams, back to back angle seams, pitted steel, and other sharp discontinuities shall be hand-stripped with a brush in the longitudinal direction with the primer coat. Bolted connections shall also have all bolt heads and nuts hand-stripped in a circular brush motion with the primer coat material. Stripe coats shall be applied before or after the full primer coat application. The primer coat material used for hand-stripping shall be tinted to distinguish it from material used for the full primer coat application.

B - Top Coat Application: After the primer coat has cured per the Manufacturer's written recommendations (not to exceed 10 days), all previously coated surfaces shall receive the top coat. The cured and dry primer coat shall be clean and free of all surface and embedded contamination and dry-spray. If it is not clean and free of all contamination, and dry-spray, the surfaces shall be cleaned by using clean rags or brushes to water wipe, solvent wipe, or detergent wash and rinse. Power washing is not allowed. Temperature ranges (both steel and air) shall be the more restrictive of that specified in the Manufacturer's written application instructions or between 50° F. to 100° F., unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the Manufacturer's written instructions.

9 – Painting of New Steel: All new steel shall be painted with the same coating system selected for use at the beam ends, unless permitted otherwise in writing. After the new steel has been fabricated, the steel shall be painted with the primer coat after preparation of the steel surfaces in accordance with the relevant requirements of this special provision including abrasive blast cleaning. All paint that is damaged by field welding operations or by any other operation shall be removed, the area cleaned to the satisfaction of the Engineer, and the affected areas repainted with the primer coat. The new steel shall then be painted with the rest of the paint system.

Method of Measurement: This item, being paid for on a lump sum basis for each bridge site, will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for “Abrasive Blast Cleaning and Field Painting of Beam Ends (Site No. X),” which price shall include all materials, equipment, abrasive blast cleaning and surface preparation, painting, coating of inaccessible areas, overspray containment enclosure, heating devices, tools, labor, and services of the technical advisor. No direct payment will be made for the cost of storage or hauling the paint and other materials to and from the bridge site, but the cost thereof shall be included in the lump sum price as noted above.

The containment and collection of surface preparation debris shall be paid for under the item “Class 1 - Containment and Collection of Surface Preparation Debris (Site No. X).”

Disposal of spent abrasive contaminated by lead shall be paid for under the item, “Disposal of Lead Debris from Abrasive Blast Cleaning.”

<u>Pay Item</u>	<u>Pay Unit</u>
Abrasive Blast Cleaning and Field Painting of Beam Ends (Site No. X)	L.S.

Comment [JLM2]: This Special Provision is OWNED by the Office of Construction - Contact Robert Obey, 860-823-3249 or email at robert.obey@ct.gov

ITEM #06036XXA – LOCALIZED PAINT REMOVAL AND FIELD PAINTING OF BEAM ENDS (SITE NO. X)

Comment [JLM1]: This Special Provision is OWNED by Robert E. Obey, District 2 ADE (860) 823-3249. Revisions are not allowed without prior consent of OWNER. Robert.Obey@ct.gov

Description: Work under this item shall consist of paint removal and field painting of the existing steel at designated areas. The work shall include containments, paint removal, collection of paint and associated debris, surface preparation and field painting. Designated areas include: areas specifically designated on the plans and those areas where construction activities required the removal of the existing coatings to accomplish other contract work (i.e., arc gouging, welding, etc.). The paint removal is required because of the possible presence of hazardous paint (e.g., containing lead or other hazardous metals). The paint removal is required to comply with OSHA and Department of Energy and Environmental Protection (DEEP) regulations.

Privately-owned utilities, bridge rails, stay-in-place forms, fences, elastomeric bearing pads and bronze components shall be protected from damage by surface preparation and painting operations and are not to be painted.

Contractor - Subcontractor Qualifications: Contractors and subcontractors doing this work are required to be certified by the SSPC Painting Contractor Certification Program (PCCP) to QP-1 entitled “Standard Procedure for Evaluating Qualifications of Painting Contractors: Field Application to Complex Structures”. When the work involves the disturbance of lead-containing paint, the contractor and subcontractor are also required to be certified to SSPC QP-2 “Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint”. The certification(s) must be kept current for the duration of the work. If a contractor’s or subcontractor’s certification expires, the firm will not be allowed to do any work related to this item until the certification is reissued. Requests for extension of time for delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. In addition, if any recoat times are exceeded, the effected areas shall be cleaned to SSPC-SP 15 and coatings reapplied in accordance with these specifications at no additional cost to the State.

Submittals: A minimum of 20 calendar days before starting any paint removal, surface preparation and coating application work, the contractor shall submit the following to the Engineer for acceptance:

- A copy of the firm’s written Quality Control Program used to control the quality of surface preparation and coating application including ambient conditions, surface cleanliness and profile, coating mixing, dry film thickness, final film continuity, etc.
- A copy of the firm’s written surface preparation and application procedures. This written program must contain a description of the equipment that will be used for surface preparation, including the remediation of soluble salts, and for paint mixing and application. Coating repair procedures shall be included.
- A detailed description of the contractor’s enforcement procedures and the authority of personnel.
- Containment plans (paint removal/collection of debris, surface preparation, coating applications, coating applications with heat, etc.).

- If the application of heat is proposed for coating application purposes, provide information on the heat containment and procedures that will be used, with data sheets for the equipment. **Note:** If heat is used for coating operations, the heat and containment must be maintained to provide the required temperatures for the duration of the **cure** period.
- Proof of SSPC-QP1 qualifications and QP2 qualifications, as applicable.
- Proof that the finish coat complies with the color and gloss retention performance criteria of SSPC Paint 36, Level 3, for accelerated weathering.
- Coating product information, including coating manufacturer, product name, application instructions, technical data, MSDS and color chips.

The Contractor shall not begin paint removal Work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal, State, or local regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Materials: The paint shall be one of the following **two coat systems**:

Carbomastic 15 Carbothane 134 HS, manufactured by:	Carboline 2150 Schuetz Road St. Louis, MO 63146 (800) 848-4645
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Epoxy Mastic Aluminum II Acrolon 218 HS, manufactured by:	Sherwin Williams 425 Benton Street Stratford, CT 06615 (203) 377-1711 (800) 474-3794
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Carbomastic 90 Carbothane 134 HS, manufactured by:	Carboline 2150 Schuetz Road St. Louis, MO 63146 (800) 848-4645
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All materials for the complete coating system shall be furnished by the same coating material manufacturer with no subcontracted manufacturing allowed. Intermixing of materials within and between coating systems will not be permitted. Thinning of paint

shall conform to the manufacturer's written recommendations. The coating thickness shall be in accordance with the Manufacturer's printed instructions. All components of the coating system and the mixed paint shall comply with the Emission Standards for Volatile Organic Compounds (VOC) stated in the Connecticut Department of Energy and Environmental Protection's Administration Regulation for the Abatement of Air Pollution, Section 22a-174-20(s).

Control of Materials: A Materials Certificate will be required for the selected paint system in accordance with Article 1.06.07, confirming the conformance of the paint to the requirements set forth in these specifications. The coating thickness shall be in accordance with the Manufacturer's printed instructions. The selected Topcoat shall conform (as close as possible) in color to the existing topcoat.

Note: If any of the above and/or following stipulated contract specifications differ from those of the manufacturer's recommended procedures or ranges, the more restrictive of the requirements shall be adhered to unless directed by the Engineer in writing.

Construction Methods: All Contractor activities associated with the work described and specified herein shall be conducted in accordance with all applicable Federal, State of Connecticut and local safety regulations and guidelines.

Quality Control Inspections: The Contractor shall perform first line, in process Quality Control (QC) inspections. The Contractor shall implement a Quality Control Program accepted by the Engineer, including written daily reports, that ensures that the work accomplished complies with these specifications. All Quality Control Reports must be reviewed and signed by either a NACE Coating Inspector Level 2 - Certified (must have completed sessions I, II and III) or SSPC – BCI Level I Inspector (Minimum qualifications). Copies of these reports shall be provided daily to the Engineer. Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and containments
- Ambient conditions
- Surface preparation (solvent cleaning or hand/power tool cleaning)
- Coating application (mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity (freedom from runs, sags, pinholes, shadow-through, skips, misses, etc.)
- Final film acceptance

Limits of Paint Removal and Field Painting: Prior to applying the heat of welding equipment to localized areas of existing steel superstructures, the existing paint shall be removed to width of 6 inches from wherever the heat will be applied, or as directed by the Engineer. The locations of the paint removal and field painting shall be reviewed and accepted by the Engineer prior to commencement of the work. Such acceptance by the Engineer does not relieve the Contractor of his responsibility for complying with applicable OSHA and DEEP regulations.

Containment for Paint Removal and Collection of Debris: The containment(s) shall be designed and erected to contain, as well as facilitate the collection of debris from the paint removal operations. Drawings and details of the containment(s) shall be submitted to the Engineer for review and comments prior to any paint removal. Review of the containment by the Engineer shall in no way relieve the Contractor of his responsibility for the containment. The containment shall conform to the requirements found within the SSPC Guide 6. The class of the containment shall be a minimum of Class 3P, modified to include paragraphs A through C:

- A. The containment materials shall be air and water impenetrable and fire resistant.
- B. With the exception of the entryways, all seams in the containment enclosure shall be lapped a minimum of 24 inches and shall be tied off at intervals not to exceed 18 inches.
- C. All attachments to bridge parapets and/or the underside of the bridge deck shall be sealed to prevent the escape of dust and debris

The above specified containment must be utilized for **all** paint removal and collection of debris operations. The containment must remain in place until all associated debris has been collected.

Storage and Disposal of Collected Debris: All of the debris resulting from the paint removal operations shall be contained and collected. Debris within containment enclosures shall be removed by HEPA vacuum collection prior to disassembly of the enclosures. All the debris, rust and paint chips shall be stored in leak proof storage containers at the project site. Debris storage shall be in accordance with Connecticut Hazardous Waste Management Regulations. The storage containers and storage locations shall be reviewed by the Engineer and shall be located in areas not subject to ponding. Storage containers shall be placed on pallets and closed and covered with tarps at all time except during placement, sampling, and disposal of the debris.

Prior to generation of any hazardous waste, the Contractor shall notify the Engineer of its selected hazardous waste transporter and disposal facility. The Contractor must submit to the Engineer: (1) the transporter's current U.S DOT Certificate of Registration and (2) the transporter's current Hazardous Waste Transporter Permits for the State of Connecticut, the hazardous waste destination state and any other applicable states. The Engineer will then obtain an EPA ID number that will be forwarded to the contractor. Any changes in transporter or facility shall be immediately forwarded to the Engineer for review.

The Contractor shall conform to the latest requirements of the Hazardous Waste Management Regulations prepared by the DEEP's Hazardous Waste Management Section, subject to regulations of Section 22a-449(c) of the Connecticut General Statutes.

Disposal of the debris after testing shall be in strict conformance with all Federal E.P.A. and DEEP regulations for hazardous materials.

All necessary forms, including the "Uniform Hazardous Waste Manifest" obtained from the Hazardous Waste Management Section of DEEP, must be filled out, approved and

signed by the Department's Project Engineer (Construction), and appropriate copies returned to the Department's Division of Environmental Compliance.

A licensed hazardous waste transporter and a licensed hazardous waste treatment/disposal facility must be secured from lists available from the DEEP and approved by the Department's Division of Environmental Compliance.

The Contractor is liable for any fines, costs or remediation costs incurred as a result of their failure to be in compliance with this special provision and all Federal, State and Local laws.

Paint Removal/Surface Preparation: The existing structural steel shall be power tool cleaned according to SSPC-SP 15 "Commercial Grade Power Tool Cleaning." The power tools (needle guns, grinders, etc.) shall be equipped with HEPA vacuum attachments. Before the power tool cleaning, all dissolvable foreign matter, such as oil, grease, and dust shall be removed by wiping or scrubbing the surface with rags or brushes wetted with solvent in accordance with the provisions of SSPC-SP 1 "Solvent Cleaning." Clean solvent and clean rags or brushes shall be used for the final wiping. The cleaned surface shall be accepted by the Engineer. If the surface is determined to meet the requirements of SSPC-SP 15, painting operations can commence.

Note: Chemical stripping and abrasive blast cleaning will not be permitted.

Existing Steel Surfaces to be Painted: After the designated areas have been inspected and accepted according to the surface preparation specification, SSPC SP 15, the steel surfaces which are to receive the field touch up paint shall be cleaned immediately prior to coating operations by wiping or scrubbing the surface with rags or brushes wetted with solvent. Use clean solvent and clean rags for the final wiping.

- Solvent must be compatible with the specified coatings. Solvent cleaned surfaces shall be primed before any detrimental recontamination or corrosion occurs. Follow manufacturer's safety recommendations when using any solvent.
- All foreign materials such as dirt, dust, loose rust scale, sand, bird droppings, and all materials loosened or deposited on the steel surface by cleaning operations shall also be completely removed by vacuuming before any painting operations commence.
- Failure by the Contractor to properly prepare and clean surfaces to be painted in accordance with the specifications shall be cause for rejection by the Engineer. All surfaces that are rejected shall be cleaned and painted to the satisfaction of the Engineer in accordance with the specifications, at no additional cost to the State.

Application of Field Paint: The method for coating application shall be by brush and roll equipment. The containment for paint application shall consist of drop clothes and a solid platform bottom.

Storage, opening, mixing, thinning and application of the paint shall be accomplished in strict accordance with the specified contract requirements and procedures published by the paint manufacturer and supplier. The Contractor shall have at the project site, at all times, the current copies of all technical data, recommendations and procedures published by the

paint manufacturer. All coatings shall be supplied in sealed containers bearing the manufacturer's name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used. Paint shall be furnished in the manufacturer's original sealed and undamaged containers. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed. The paint shall be applied to produce a uniform smooth coat without runs, streaks sags, wrinkles, or other defects.

The Contractor shall provide a suitable facility for the storage of paint, which is in accordance with the latest Federal and State regulations. This facility must provide protection from the elements and insure that the paint is not subjected to temperatures outside the manufacturer's recommended extremes. Storage for paint must be located in reasonable proximity to the painting locations. The Engineer shall be provided access to the stored paint at any time, for inspection and to witness removal of the materials. The Contractor's facility for the storage of paint is subject to the approval of the Engineer.

Ambient Conditions: No solvent cleaning just prior to coating application or coating application work shall be performed when the conditions are as follow:

- When the relative humidity is at or above 80 percent or when there is falling rain or dew present, or anticipated, before a prepared surface can be coated.
- When the substrate is damp or covered by frost or ice.
- When the surface temperature or air temperature are less than 50 degrees Fahrenheit or greater than 100 degrees Fahrenheit.
- When the surface temperatures of the steel or air are less than five (5) degrees Fahrenheit above the dewpoint temperature as determined by a surface temperature thermometer and electric or sling psychrometer.

The Contractor is liable for any fines, costs, or remediation costs incurred as a result of his failure to be in compliance with this special provision and all federal, state, and local laws.

Method of Measurement: Payment for this item will be at the contract lump sum price for each completed bridge structure.

Basis of Payment: This work will be paid for at the contract Lump Sum price for "Localized Paint Removal and Field Painting of Beam Ends (Site No. X)", complete in place, which price shall include all materials, containments, collection and disposal of non-hazardous debris, containers, equipment, tools, labor, heating devices, services of the technical advisor and for any incidental work. No direct payment will be made for the cost of storage or hauling the paint and other materials, including paint chips and associated debris, to and/or from the bridge site, but the cost thereof shall be included in the contract lump sum price.

Comment [JLM2]: Designer to eliminate payment language related to disposal of non-hazardous debris if Lead Disposal Item(s) from Environmental Compliance are included in the contract.

Pay Item
Localized Paint Removal and Field Painting of Beam Ends (Site No. X)

Pay Unit
L.S.

Comment [JLM3]: Ownership of this Special Provision lies with the Office of Construction - Contact Robert Obey 860-823-3249 or email robert.obey@ct.gov

ITEM #0603729A – LOCALIZED PAINT REMOVAL AND FIELD PAINTING OF EXISTING STEEL

Comment [JLM1]: Ownership of this Special Provision lies with the Office of Construction - Contact Robert Obey 860-823-3249 or email robert.obey@ct.gov

Description: Work under this item shall consist of paint removal and field painting of the existing steel at designated areas. The work shall include containments, paint removal, collection of paint and associated debris, surface preparation and field painting. Designated areas include: areas specifically designated on the plans and those areas where construction activities required the removal of the existing coatings to accomplish other contract work (i.e., arc gouging, welding, etc.). The paint removal is required because of the possible presence of hazardous paint (e.g., containing lead or other hazardous metals). The paint removal is required to comply with OSHA and DEEP (Department of Energy and Environmental Protection) regulations.

Privately-owned utilities, bridge rails, stay-in-place forms, fences, elastomeric bearing pads and bronze components shall be protected from damage by surface preparation and painting operations and are not to be painted.

Contractor - Subcontractor Qualifications: Contractors and subcontractors doing this work are required to be certified by the SSPC Painting Contractor Certification Program (PCCP) to QP-1 entitled “Standard Procedure for Evaluating Qualifications of Painting Contractors: Field Application to Complex Structures”. When the work involves the disturbance of lead-containing paint, the contractor and subcontractor are also required to be certified to SSPC QP-2 “Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint”. The certification(s) must be kept current for the duration of the work. If a contractor’s or subcontractor’s certification expires, the firm will not be allowed to do any work related to this item until the certification is reissued. Requests for extension of time for delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. In addition, if any recoat times are exceeded, the effected areas shall be cleaned to SSPC-SP 15 and coatings reapplied in accordance with these specifications at no additional cost to the State.

Submittals: A minimum of 20 calendar days before starting any paint removal, surface preparation and coating application work, the contractor shall submit the following to the Engineer for acceptance:

- A copy of the firm’s written Quality Control Program used to control the quality of surface preparation and coating application including ambient conditions, surface cleanliness and profile, coating mixing, dry film thickness, final film continuity, etc.
- A copy of the firm’s written surface preparation and application procedures. This written program must contain a description of the equipment that will be used for surface preparation, including the remediation of soluble salts, and for paint mixing and application. Coating repair procedures shall be included.
- A detailed description of the contractor’s enforcement procedures and the authority of personnel.
- Containment plans (paint removal/collection of debris, surface preparation, coating

materials within and between coating systems will not be permitted. Thinning of paint shall conform to the manufacturer's written recommendations. The coating thickness shall be in accordance with the Manufacturer's printed instructions. All components of the coating system and the mixed paint shall comply with the Emission Standards for Volatile Organic Compounds (VOC) stated in the Connecticut Department of Energy and Environmental Protection's Administration Regulation for the Abatement of Air Pollution, Section 22a-174-20(s).

Control of Materials: A Materials Certificate will be required for the selected paint system in accordance with Article 1.06.07, confirming the conformance of the paint to the requirements set forth in these specifications. The coating thickness shall be in accordance with the Manufacturer's printed instructions. The selected Topcoat shall conform (as close as possible) in color to the existing topcoat.

Note: If any of the above and/or following stipulated contract specifications differ from those of the manufacturer's recommended procedures or ranges, the more restrictive of the requirements shall be adhered to unless directed by the Engineer in writing.

Construction Methods: All Contractor activities associated with the work described and specified herein shall be conducted in accordance with all applicable Federal, State of Connecticut and local safety regulations and guidelines.

Quality Control Inspections: The Contractor shall perform first line, in process Quality Control (QC) inspections. The Contractor shall implement a Quality Control Program accepted by the Engineer, including written daily reports, that ensures that the work accomplished complies with these specifications. All Quality Control Reports must be reviewed and signed by either a NACE Coating Inspector Level 2 - Certified (must have completed sessions I, II and III) or SSPC – BCI Level I Inspector (Minimum qualifications). Copies of these reports shall be provided daily to the Engineer. Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and containments
- Ambient conditions
- Surface preparation (solvent cleaning or hand/power tool cleaning)
- Coating application (mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity (freedom from runs, sags, pinholes, shadow-through, skips, misses, etc.)
- Final film acceptance

Limits of Paint Removal and Field Painting: Prior to applying the heat of welding equipment to localized areas of existing steel superstructures, the existing paint shall be removed to a width of 6 inches from wherever the heat will be applied, or as directed by the Engineer. The locations of the paint removal and field painting shall be reviewed and accepted by the Engineer prior to commencement of the work. Such acceptance by the Engineer does not relieve the Contractor of his responsibility for complying with applicable

OSHA and DEEP regulations.

Containment for Paint Removal and Collection of Debris: The containment(s) shall be designed and erected to contain, as well as facilitate the collection of debris from the paint removal operations. Drawings and details of the containment(s) shall be submitted to the Engineer for review and comments prior to any paint removal. Review of the containment by the Engineer shall in no way relieve the Contractor of his responsibility for the containment. The containment shall conform to the requirements found within the SSPC Guide 6. The class of the containment shall be a minimum of Class 3P, modified to include paragraphs A through C:

- A. The containment materials shall be air and water impenetrable and fire resistant.
- B. With the exception of the entryways, all seams in the containment enclosure shall be lapped a minimum of 24 inches and shall be tied off at intervals not to exceed 18 inches.
- C. All attachments to bridge parapets and/or the underside of the bridge deck shall be sealed to prevent the escape of dust and debris

The above specified containment must be utilized for **all** paint removal and collection of debris operations. The containment must remain in place until all associated debris has been collected.

Storage and Disposal of Collected Debris: All of the debris resulting from the paint removal operations shall be contained and collected. Debris within containment enclosures shall be removed by HEPA vacuum collection prior to disassembly of the enclosures. All the debris, rust and paint chips shall be stored in leak proof storage containers at the project site. Debris storage shall be in accordance with Connecticut Hazardous Waste Management Regulations. The storage containers and storage locations shall be reviewed by the Engineer and shall be located in areas not subject to ponding. Storage containers shall be placed on pallets and closed and covered with tarps at all time except during placement, sampling, and disposal of the debris.

Prior to generation of any hazardous waste, the Contractor shall notify the Engineer of its selected hazardous waste transporter and disposal facility. The Contractor must submit to the Engineer: (1) the transporter's current U.S DOT Certificate of Registration and (2) the transporter's current Hazardous Waste Transporter Permits for the State of Connecticut, the hazardous waste destination state and any other applicable states. The Engineer will then obtain an EPA ID number that will be forwarded to the contractor. Any changes in transporter or facility shall be immediately forwarded to the Engineer for review.

The Contractor shall conform to the latest requirements of the Hazardous Waste Management Regulations prepared by the DEEP's Hazardous Waste Management Section, subject to regulations of Section 22a-449(c) of the Connecticut General Statutes.

Disposal of the debris shall be in strict conformance with all Federal E.P.A. and DEEP regulations for hazardous materials.

All necessary forms, including the "Uniform Hazardous Waste Manifest" obtained from the Hazardous Waste Management Section of DEEP, must be filled out, approved and signed by the Department's Project Engineer (Construction), and appropriate copies returned to the Department's Division of Environmental Compliance.

A licensed hazardous waste transporter and a licensed hazardous waste treatment/disposal facility must be secured from lists available from the DEEP and approved by the Department's Division of Environmental Compliance.

The Contractor is liable for any fines, costs, or remediation costs incurred as a result of their failure to be in compliance with this special provision and all Federal, State and Local laws.

Paint Removal/Surface Preparation: The existing structural steel shall be power tool cleaned according to SSPC-SP 15 "Commercial Grade Power Tool Cleaning." The power tools (needle guns, grinders, etc.) shall be equipped with HEPA vacuum attachments. Before the power tool cleaning, all dissolvable foreign matter, such as oil, grease, and dust shall be removed by wiping or scrubbing the surface with rags or brushes wetted with solvent in accordance with the provisions of SSPC-SP 1 "Solvent Cleaning." Clean solvent and clean rags or brushes shall be used for the final wiping. The cleaned surface shall be accepted by the Engineer. If the surface is determined to meet the requirements of SSPC-SP 15, painting operations can commence.

Note: Chemical stripping and abrasive blast cleaning will not be permitted.

Existing Steel Surfaces to be Painted: After the designated areas have been inspected and accepted according to the surface preparation specification, SSPC SP 15, the steel surfaces which are to receive the field touch up paint shall be cleaned immediately prior to coating operations by wiping or scrubbing the surface with rags or brushes wetted with solvent. Use clean solvent and clean rags for the final wiping.

- Solvent must be compatible with the specified coatings. Solvent cleaned surfaces shall be primed before any detrimental recontamination or corrosion occurs. Follow manufacturer's safety recommendations when using any solvent.
- All foreign materials such as dirt, dust, loose rust scale, sand, bird droppings, and all materials loosened or deposited on the steel surface by cleaning operations shall also be completely removed by vacuuming before any painting operations commence.
- Failure by the Contractor to properly prepare and clean surfaces to be painted in accordance with the specifications shall be cause for rejection by the Engineer. All surfaces that are rejected shall be cleaned and painted to the satisfaction of the Engineer in accordance with the specifications, at no additional cost to the State.

Application of Field Paint: The method for coating application shall be by brush and roll equipment. The containment for paint application shall consist of drop clothes and a solid platform bottom.

Storage, opening, mixing, thinning and application of the paint shall be accomplished in strict accordance with the specified contract requirements and procedures published by the paint manufacturer and supplier. The Contractor shall have at the project site, at all times, the current copies of all technical data, recommendations and procedures published by the paint manufacturer. All coatings shall be supplied in sealed containers bearing the manufacturer's name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used. Paint shall be furnished in the manufacturer's original sealed and undamaged containers. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed. The paint shall be applied to produce a uniform smooth coat without runs, streaks, sags, wrinkles, or other defects.

The Contractor shall provide a suitable facility for the storage of paint, which is in accordance with the latest Federal and State regulations. This facility must provide protection from the elements and insure that the paint is not subjected to temperatures outside the manufacturer's recommended extremes. Storage for paint must be located in reasonable proximity to the painting locations. The Engineer shall be provided access to the stored paint at any time, for inspection and to witness removal of the materials. The Contractor's facility for the storage of paint is subject to the approval of the Engineer.

Ambient Conditions: No solvent cleaning just prior to coating application or coating application work shall be performed when the conditions are as follow:

- When the relative humidity is at or above 80 percent or when there is falling rain or dew present, or anticipated, before a prepared surface can be coated.
- When the substrate is damp or covered by frost or ice.
- When the surface temperature or air temperature are less than 50 degrees Fahrenheit or greater than 100 degrees Fahrenheit.
- When the surface temperatures of the steel or air are less than five (5) degrees Fahrenheit above the dewpoint temperature, as determined by a surface temperature thermometer and electric or sling psychrometer.

The Contractor is liable for any fines, costs, or remediation costs incurred as a result of his failure to be in compliance with this special provision and all federal, state, and local laws.

Method of Measurement: This work will be measured by the actual square foot of existing steel at designated areas where paint was removed, surfaces cleaned, re-painted and accepted. **Note:** In some instances when **new steel** is being added to the designated areas where the paint was removed, the removal area may not equal the area to be re-painted. Measurement in these cases will be by the actual s.f. of existing steel where the paint was removed and accepted.

Basis of Payment: This work will be paid for at the unit price per square foot for "Localized Paint Removal and Field Painting of Existing Steel," complete in place, which price shall include all materials, containments, collection and disposal of non-hazardous debris, containers, equipment, tools, labor, heating devices, services of the technical

advisor and for any incidental work. No direct payment will be made for the cost of storage or hauling the paint and other materials, including paint chips and associated debris, to and/or from the bridge site, but the cost thereof shall be included in the contract unit price.

Comment [JLM2]: Designer to eliminate payment language related to disposal of non-hazardous debris if Lead Disposal Item(s) from Environmental Compliance are included in the contract.

<u>Pay Item</u>	<u>Pay Unit</u>
Localized Paint Removal And Field Painting Of Existing Steel	S.F.

Comment [JLM3]: Ownership of this Special Provision lies with the Office of Construction - Contact Robert Obey 860-823-3249 or email robert.obey@ct.gov

ITEM #06039XXA - ABRASIVE BLAST CLEANING AND FIELD PAINTING OF STRUCTURE (SITE NO. X)

Description: Work under this item shall consist of surface preparation and field painting of the steel components of structures as shown on the plans, as directed by the Engineer and according to these specifications.

All structural steel, except those specific components listed below or on the plans, shall be abrasive blast cleaned and painted with a three-coat system.

Components to be painted are as shown on the plans and may include but not be limited to the following: beams and girders, diaphragms and cross frames, steel bearings, the inside surfaces of box girders, scuppers, drainage pipes and troughs, state-owned utility conduits, structural steel utility supports, non galvanized structure mounted sign supports, steel grid decks, and all other metal components that are an integral part of the bridge system.

Privately-owned utilities, bridge rails, stay-in-place forms, fences, elastomeric bearing pads and bronze components shall be protected from damage by surface preparation and painting operations and are not to be painted.

Tabulated data for the structures, including the Federal Standard 595 Color Number for the top coat, are listed in tables on the plans. The estimated surface area of structural steel to be painted on each structure is given as a guide only, and is not guaranteed to be accurate. Bidders shall examine the listed structures and shall make their own determinations as to the work involved and conditions to be encountered

Comment [JLM1]: Note to Designers - Put Table of Site No(s) and Federal Color Number(s) on the Plans

Submittals: A minimum of 20 calendar days before starting any surface preparation and coating application work, the painting contractor shall submit the following to the Engineer for acceptance:

1. A copy of the firm's written Quality Control Program used to control the quality of surface preparation and coating application including ambient conditions, surface cleanliness and profile, coating mixing, dry film thickness, final film continuity, etc.
2. A copy of the firm's written surface preparation and application procedures. This written program must contain a description of the equipment that will be used for removal of laminar and stratified rust, for surface preparation, including the remediation of soluble salts, and for paint mixing and application, including stripe coating. Coating repair procedures shall be included.
3. A detailed description of the contractor's enforcement procedures and the authority of personnel.

4. Containment plans (paint removal/collection of debris, surface preparation, coating applications with heat, etc.)
5. If the application of heat is proposed for coating application purposes, provide information on the heat containment and procedures that will be used, with data sheets for the equipment. Note: If heat is used for coating operations, the heat and containment must be maintained to provide the required temperatures for the duration of the cure period.
6. Proof of SSPC-QP1 qualifications and QP2 qualifications, as applicable.
7. Proof that the finish coat complies with the color and gloss retention performance criteria of SSPC Paint 36, Level 3, for accelerated weathering.
8. Coating product information, including coating manufacturer, product name, application instructions, technical data, MSDS and color chips.
9. Abrasive product information, including abrasive manufacturer, product name, technical data, and MSDS.
10. Touch-up and repair procedures, including methods and materials.

The Contractor shall not begin any paint removal Work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal, State, or local regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Materials: The materials for the coating system for this work shall conform to the requirements of Section M07.02 and the following:

The coating system shall be a 3-coat system selected by the Contractor and accepted by the Engineer. The system shall be on the NEPCOAT Qualified Products List A (Inorganic Zinc Rich Primer / Epoxy or Urethane Intermediate / Aliphatic Urethane Finish) or List B (Organic Zinc Rich Primer / Epoxy or Urethane Intermediate / Aliphatic Urethane Finish) for Protective Coatings for New and 100% Bare Existing Steel for Bridges.

All materials for the complete coating system shall be furnished by the same coating material manufacturer with no subcontracted manufacturing allowed. Intermixing of materials within and between coating systems will not be permitted. Thinning of paint shall conform to the manufacturer's written recommendations. All components of the coating system and the mixed paint shall comply with the Emission Standards for Volatile Organic Compounds (VOC) stated

in the Connecticut Department of Energy and Environmental Protection's Administration Regulation for the Abatement of Air Pollution, Section 22a-174-20(s).

The top coat shall comply with the color and gloss retention performance criteria of SSPC Paint 36, Level 3, for accelerated weathering. After 2000 hours of accelerated weathering in accordance with ASTM D4587, the color change (ASTM D 2244) shall be less than 2.0 ΔE^* with a loss of gloss (ASTM D 523) less than 30. With the submittals, the Contractor shall provide the Engineer with proof that the finish coat complies with the above criteria.

The abrasive media for blast cleaning shall be recyclable steel grit.

Control of Materials:

A Materials Certificate will be required for the selected paint system in accordance with Article 1.06.07, confirming the conformance of the paint to the requirements set forth in these specifications.

Note: If any of the above and/or following stipulated contract specifications differ from those of the manufacturer's recommended procedures or ranges, the more restrictive of the requirements shall be adhered to unless directed by the Engineer in writing.

Construction Methods:

Contractor - Subcontractor Qualifications: Contractors and subcontractors doing this work are required to be certified by the SSPC Painting Contractor Certification Program (PCCP) to QP-1 entitled "Standard Procedure for Evaluating Qualifications of Painting Contractors: Field Application to Complex Structures". When the work involves the disturbance of lead-containing paint, the contractor and subcontractor are also required to be certified to SSPC QP-2 "Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint". The certification(s) must be kept current for the duration of the work. If a contractor's or subcontractor's certification expires, the firm will not be allowed to do any work on this item until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. In addition, if any recoat times are exceeded, the effected areas shall be abrasive blast cleaned to SSPC-SP 10 and coatings reapplied in accordance with these specifications at no additional cost to the State. At the option of the Engineer, if such a delay will adversely impact the successful and timely completion of the project, the Department may require the Contractor to engage another SSPC certified contractor to do the painting work at the prime contractor's expense.

Quality Control Inspections: The Contractor shall perform first line, in process Quality Control (QC) inspections. The Contractor shall implement a Quality Control Program accepted by the Engineer, including written daily reports, that ensures that the work accomplished complies with these specifications. Copies of these reports shall be provided daily to the Engineer. Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and containments
- Ambient conditions
- Surface preparation (solvent cleaning, hand/power tool or abrasive blast cleaning, etc.)
- Coating application (mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses, etc.)
- Final film acceptance

The personnel managing and performing the quality control program shall be NACE Certified Coating Inspector(s) (successfully completed Sessions I, II, III and Peer Review) or shall provide evidence of successful inspection of 3 projects of similar size and scope that have been completed in the last 2 years. References shall include the name, address, and telephone number of a contact person employed by the bridge owner. The personnel performing the quality control tests shall be trained in the use of the quality control instruments. Documentation of training shall be provided. These personnel shall not perform surface preparation and painting.

Test Equipment and Materials: The Contractor shall furnish the following new test equipment and materials for use by the QC Inspector:

1. Two PTC Surface Temperature Thermometers
2. Psychron 566 Psychrometer (Battery Operated) with two sets of batteries or a Bacharach Sling Psychrometer
3. U.S. Weather Bureau Psychrometric Tables
4. Hypodermic Needle Pressure Gage for nozzle pressure tests.
5. SSPC Visual Standards VIS 1, VIS 3, and/or VIS 4, as applicable.
6. Testex Spring Micrometer
7. Testex Press-O-Film Replica Tape, one roll (100 pieces) each of coarse and extra-coarse per bridge span.
8. Wet film thickness gage
9. PosiTest, Mikrotest or Elcometer Dry Film Thickness Gauge (FM)
10. SSPC Type 2 Dry Film Thickness Gauge per PA2
11. NIST (NBS) Calibration Standards Range: 0 – 39 mils

Quality Assurance Inspections: The Engineer may conduct Quality Assurance (QA) observations of any or all phases of the work. The presence or activity of Engineer inspections in no way relieves the Contractor of the responsibility to provide all necessary daily Quality Control inspections of its own and to comply with all requirements of this Specification.

The Contractor shall facilitate the Engineer's inspections as required, including allowing ample time for the inspections and providing suitable lighting (50 foot candles minimum at the surface as defined later in this specification). The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit inspection and close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. The

Contractor shall notify the Engineer in advance of plans to remove staging used in cleaning and painting operations in order to allow for inspection. The QA inspection will be performed with his own equipment when verifying the Contractor's test results in the field.

Safety: All Contractor activities associated with the coating work described and specified herein shall be conducted according to all applicable Federal (OSHA), State of Connecticut safety regulations and SSPC-PA Guide 3 entitled "A Guide to Safety in Paint Application".

Ambient Conditions: Surface preparation and coating application work shall only be done inside a containment enclosure as specified elsewhere in these specifications. No surface preparation or coating work shall be performed when the conditions inside the containment enclosure are as follows:

- When the relative humidity is at or above 90 percent.
- When the substrate is damp or covered by frost or ice.
- When the surface temperature or air temperature are less than 50 degrees Fahrenheit or greater than 100 degrees Fahrenheit.
- When the surface temperatures of the steel or air are less than five (5) degrees Fahrenheit above the dewpoint temperature as determined by a surface temperature thermometer and electric or sling psychrometer.

If the requirements of the coating manufacturer differ from the ranges provided above, comply with the most restrictive requirements unless directed otherwise by the Engineer in writing.

Protective Coverings: The Contractor shall protect property, pedestrians, vehicular, and other traffic upon, underneath, or near the bridge, and all portions of the bridge superstructure and substructure against abrasive blast cleaning damage or disfigurement from splatters, splashes, or spray of paint or paint materials. All coating overspray, drips and spills shall be contained. Maintain the integrity and security of all protective coverings and containment materials throughout the entire project.

Any paint chips, paint removal media (e.g., abrasives), coating or solvent that has escaped the Contractor's containment enclosure shall be cleaned up immediately. For bridges over water, the Contractor shall have on site a sufficient quantity of spill containment boom and pads to contain a spill. The length of containment boom on site shall be at least equal to twice the length of the active work site over the water.

Observed Steel Defects: If significant deficiencies, such as cracks or section losses, are found during cleaning or coating operations, the Contractor shall immediately notify the Engineer as to their extent. Significant deficiencies include the following:

- a) Cracks in any part of the superstructure
- b) Section loss more than 1/8 of an inch or section loss equal to or greater than 5 percent of flange thickness in the maximum moment areas (i.e. Section loss in the middle one half of a single span structure.)

- c) Section loss more than 1/4 of an inch or section loss equal to or greater than 25 percent of the flange thickness in other than the maximum moment areas (ie. Section loss up to quarter points of the middle one half of a single span structure.)
- d) Section loss more than 1/8 of an inch or section loss equal to or greater than 15 percent of web thickness in the maximum shear areas (i.e. Section loss within five feet of the bearing center line.)
- e) Section loss more than 1/8 of an inch or section loss equal to or greater than 25 percent of web thickness in other than the maximum shear areas (i.e. Section loss found a minimum of five feet beyond the bearing center line.)

Heating Devices: The contractor may use heating devices to obtain and maintain a condition within the containment enclosure that is suitable for surface preparation and painting application. For painting applications the required conditions must be maintained for the duration of the cure period. Heating devices shall be limited to gas or oil-fired indirect air heaters in which the combustion products are discharged separately from the forced airstream to an area outside the containment enclosure. The heating devices must be configured so as not to form condensation on cold surfaces or cause rust-back and must be automatically controlled. Information describing the proposed heating devices and the proposed heating procedures shall be provided a minimum of 20 days in advance for Engineer acceptance.

Lighting Requirements: A minimum illumination level of 20 foot-candles shall be provided throughout the inside of the containment enclosure during surface preparation and coating application work. A minimum illumination level of 50 foot-candles shall be provided at the location of the specific work task and for inspection. All lighting fixtures and related connectors located inside the containment enclosure must be explosion proof and UL listed.

Material Storage: The Contractor shall provide a suitable facility for the storage of paint that complies with all Federal and State laws and regulations.

This facility shall provide protection from the elements and ensure that the paint is not subjected to temperatures outside of the more stringent of (1) the manufacturer's written recommended temperature extremes, or (2) below 40 degrees Fahrenheit or above 100 degrees Fahrenheit. If paint application takes place in conditions that require heating of the containment, then the temperature of the stored paint shall be maintained as at similar temperature. Storage of paint shall be in reasonable proximity to the painting locations. The Engineer shall be provided access to the stored paint anytime for inspection and to witness removal of the materials. The Contractor's facility for the storage of paint shall be subject to the approval of the Engineer.

Equipment: All equipment used in surface preparation and removal of debris, such as hoses, hoppers, recycling and vacuum machines that the Contractor brings to the site, shall be clean and free of any prior debris.

Spray equipment, brushes and rollers used in application of coatings shall be sized sufficiently and be in proper working order to accomplish the work according to the manufacturer's written recommendations.

Compressed Air: All compressed air sources shall have oil and moisture separators, attached and functional, and properly designed and sized. The compressed air sources shall deliver air to the blast nozzle, for blowing down the surfaces, or for conventional spray application that is free of oil and moisture and of sufficient pressure to accomplish the associated work efficiently and effectively. The tanks on the air compressor and moisture separator shall be drained at the end of each workday. The compressed air source shall produce a minimum pressure of 90 psi at the nozzle during abrasive blast cleaning.

The Contractor shall verify that the compressed air is free of moisture and oil contamination in accordance with the requirements of ASTM D4285. The tests shall be conducted at least every four hours for each compressor system in operation. Sufficient freedom from oil and moisture is confirmed if soiling or discoloration is not visible on the paper. If air contamination is evidenced, the Contractor shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry, air.

Test Sections: Prior to surface preparation, the Contractor shall prepare a test section(s) on each structure to be painted in a location(s) that the Engineer considers to be representative of the existing surface condition and steel type for the structure as a whole. The test section(s) shall be prepared using the same equipment, materials and procedures as the production operations. The Contractor shall prepare the test section(s) to the specified level according to the appropriate SSPC written specifications and visual standards. The written requirements of the specification prevail in the event of a conflict with the SSPC visual standards. Only after a test section area has been approved shall the Contractor proceed with surface preparation operations. The test section(s) shall cover approximately 10 square feet each. Additional compensation will not be allowed the Contractor for preparation of test sections.

For the production cleaning operations, the specifications and written definitions, the test section(s), and the SSPC visual standards shall be used in that order for determining compliance with the contractual requirements.

Surface Preparation:

1 – Laminar and Stratified Rust: All laminar and stratified rust or corrosion products that have formed on any area of the existing steel surfaces and accessible rust formed along edges of connected plates or shapes of structural steel shall be removed. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the surface preparation or removal of rust results in nicks or gouges, the work will be suspended. The Contractor shall demonstrate that the necessary adjustments have been made to prevent a reoccurrence of the damage prior to resuming work.

2 – Near White Metal Blast Cleaning (SSPC-SP10): Steel surfaces shall be cleaned by the

specified methods described in the SSPC Steel Structures Painting Manual, Volume 2 - Systems and Specifications, latest edition. The structural steel shall be abrasive blast cleaned according to SSPC-SP 10 "Near White Blast Cleaning". Before and after blast cleaning, all dissolvable foreign matter, such as oil, grease, and dust shall be removed by wiping or scrubbing the surface with rags or brushes wetted with solvent in accordance with the provisions of SSPC-SP 1 "Solvent Cleaning." Clean solvent and clean rags or brushes shall be used for the final wiping.

All foreign materials such as dirt, dust, rust scale, sand, bird droppings, and all materials loosened by abrasive blasting operations shall be completely removed by vacuuming before any painting operations are begun.

The cleaned surface shall be accepted by the Engineer before any painting. If the surface is determined to meet the requirements of SSPC-SP 10, painting operations can commence. The prime coat shall be applied to the steel before the end of the day that preparation was performed and before the formation of any flash rusting or rerusting of the steel. Flash rusting or rerusting of the surface is unacceptable and requires additional blast cleaning prior to painting.

Failure of the Contractor to prepare and clean the surfaces to be painted according to these specifications shall be cause for rejection by the Engineer. All surfaces that are rejected shall be recleaned to the satisfaction of the Engineer according to these specifications, at no additional cost to the State.

3 – Steel Grit Abrasive Mix: The recyclable steel grit abrasive mix shall be maintained and monitored such that the final surface profile is within the range specified elsewhere in these specifications.

Before each reuse, the recyclable steel grit abrasive shall be cleaned of millscale, rust, paint, and other contaminants by an abrasive reclaimer.

On a weekly basis during blast cleaning operations, the Contractor shall verify that the recycled steel grit abrasives meet the requirements of SSPC-AB2. If the abrasive fails the testing, all abrasive blast cleaning operations shall be suspended. The abrasive reclaimer shall be repaired and another abrasive sample will be required for testing after grit recovery and reclassification. For test results within the acceptable limits, abrasive blast cleaning may resume. Test results outside of the acceptable limits will require additional equipment repairs or replacement at no cost to the State. If additional repairs were performed, another sample will be required for testing after grit recovery and reclassification. If the test results continue to remain outside of the acceptable limits, the Contractor shall replace the abrasive reclaimer at no cost to the State.

4 - Surface Profile: The specified height of the steel surface profile is 1-3 mils and shall be uniform. Verification of the profile height will be done with Testex Replica Tape. A surface profile correction factor will be measured according to SSPC-PA 2, Section 2.2.4 with the dry film thickness gauge.

Note: Chemical Stripping will not be permitted.

Painting Operation:

1 - General: All coatings shall be supplied in sealed containers bearing the manufacturers name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used. Storage, opening, mixing, thinning and application of coating materials shall be accomplished in strict accordance with the written requirements and procedures published by the respective coating material manufacturer and supplier. In the event of a conflict, the Contractor shall notify the Engineer in writing, and unless directed otherwise in writing, the requirements of this specification shall prevail. The Contractor shall always have at the project site the current copies of all material safety data sheets (MSDS), technical data, recommendations and procedures published by the coating manufacturer for the coating materials.

2 - Paint Mixing and Thinning: Thinning shall be performed only to the extent allowed by the manufacturer's written instructions, and only with the manufacturer's approved thinner. In no case shall thinning be permitted that would cause the coating to exceed the local VOC restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers in the original containers, or as directed by the manufacturer, before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. Excessive skinning or partial hardening due to improper or prolonged storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, painter's buckets, etc. overnight. It shall be stored in a covered container and remixed before use.

The Engineer reserves the right to sample field paint (individual components and/or the mixed material) and have it analyzed. If the paint does not meet the product requirements due to excessive thinning or because of other field problems, the coating shall be removed from that section of the structure and replaced as directed by the Engineer.

3 - Methods of Application: All applicators of the specified coating material shall show proficiency on a test panel, or a portion of the structure as selected by the Engineer, to the satisfaction of the Engineer before commencing full-scale application.

The preferred method for coating application shall be by airless spray equipment. For stripping and for application in areas where complex shapes or tight clearances will not allow spray application, the Contractor shall apply the coating material by appropriately designed and constructed rollers and brushes.

4 – Recoat Times: The recoat time of the primer, intermediate and top coat shall not deviate from the written recommendation of the manufacturer or the times specified in these specifications, complying with the most restrictive requirements unless directed otherwise by the Engineer in writing. If any individual time is exceeded, the effected areas shall be abrasive blast cleaned to SSPC-SP 10 and coatings reapplied in accordance with these specifications at no additional cost to the State.

5 – Film Continuity: All applied coatings shall exhibit no running, streaking, sagging, wrinkling, holidays, pinholes, top coat color or gloss variation, or other film defects. Failure of the Contractor to apply coatings that are free of film defects shall be cause for rejection by the Engineer. All coatings rejected shall be repaired to the satisfaction of the Engineer, at no additional cost to the State. Before doing any coating repair work, the Contractor shall submit to the Engineer for approval the procedures that will be used to repair the coating.

6 - Technical Advisor: It is mandatory that the Contractor obtain the services of a qualified technical advisor employed by the coating manufacturer. This advisor shall be familiar with the technical properties of the coating products and proper application methods. The technical advisor shall assist the Engineer and the Contractor in establishing correct application methods for the complete coating system. He/she shall be present at the work site before the opening of the material containers and shall remain at the site until the Engineer is satisfied that the Contractor's personnel have mastered the proper handling, mixing and application of the material. The Engineer may call the technical advisor back to the site if there are concerns that the Contractor is not handling, mixing or applying the material correctly.

7 - Containment Plan: For each individual site, the Contractor shall submit a plan of containment to the Engineer for acceptance. The plan, as outlined in other contract item special provisions, shall be submitted twenty days before commencing painting operation. The prime coat is applied within the same containment used for abrasive blast cleaning. After prime coat application, the minimum containment enclosure for the intermediate and top coat shall conform to the requirements of SSPC Guide 6, Class 3A and the following:

- Components of the containment system must be made from flame retardant materials.
- Tarpaulin material shall be clean and impermeable to air and water.
- Joints shall be fully sealed except for entryways.
- Entryways shall use multiple flap overlapping door tarps to minimize dust escape through the entryway.
- All mists or dust shall be filtered with collection equipment.
- For truss bridges a ceiling shall also be included.

8 - Prime Coat Application: All prepared surfaces shall be cleaned by vacuuming to remove dust, remaining debris, and other surface contaminants before coating. Such surfaces shall then be sprayed, brushed or rolled within the specified abrasive blast cleaning containment enclosure with the specified primer material before the end of the day or before any visible rust-back occurs. If rust-back occurs, effected surfaces shall be re-cleaned to the satisfaction of the Engineer according to these specifications, at no additional cost to the State.

All plate and shape edges, plate seams, back to back angle seams, pitted steel, and other sharp discontinuities shall be hand-stripped with a brush in the longitudinal direction with the primer. Bolted connections shall also have all bolt heads and nuts hand-stripped in a circular brush motion with the primer material. Stripe coats shall be applied before or after the full prime coat application. The prime coat material used for hand-stripping shall be tinted to distinguish it from material used for full prime coat application.

The zinc rich primer shall be applied to dry surfaces within the more restrictive temperature range (both steel and air) as specified in the manufacturer's written application instructions or between 50 degrees Fahrenheit to 100 degrees Fahrenheit, unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the manufacturer's written instructions in effect at the time that the product was tested for NEPCOAT. The dry film thickness will be checked for compliance by measuring above the peaks of the substrate profile per the guidelines of SSPC-PA 2.

The dry primer shall be free of all surface and embedded contamination and dry spray.

9 - Intermediate Coat Application: When the primer has cured per the manufacturer's recommendations (not to exceed 30 days), all previously coated surfaces shall receive the intermediate coat. The cured and dry primer coat shall be clean and free of all surface and embedded contamination and dry-spray. If it is not clean and free of all contamination, and dry-spray, the surfaces shall be cleaned by using clean rags or brushes to water wipe, solvent wipe, or detergent wash and rinse. Power washing is not allowed. Temperature ranges (both steel and air) shall be the more restrictive of that specified in the manufacturer's written application instructions or between 50 degrees Fahrenheit to 100 degrees Fahrenheit, unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the manufacturer's written instructions in effect at the time that the product was tested for NEPCOAT. The intermediate coat shall be of a contrasting color to the prime and topcoat colors. The dry film thickness will be checked for compliance per the guidelines of SSPC-PA 2.

10 - Top Coat Application: When the intermediate coat has cured per the manufacturer's written recommendations (not to exceed 10 days), all previously coated surfaces shall receive the top coat. The cured and dry intermediate coat shall be clean and free of all surface and embedded contamination and dry-spray. If it is not clean and free of all contamination, and dry-spray, the surfaces shall be cleaned by using clean rags or brushes to water wipe, solvent wipe, or detergent wash and rinse. Power washing is not allowed. Temperature ranges (both steel and air) shall be the more restrictive of that specified in the manufacturer's written application instructions or between 50 degrees Fahrenheit to 100 degrees Fahrenheit, unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the manufacturer's written instructions in effect at the time that the product was tested for NEPCOAT.

11 - Date of Completion: The word "PAINTED", followed by the month and year the painting of each structure is completed along with the manufacturer's abbreviations for each of the three coats, shall be stenciled on the inside of a fascia girder at mid-depth of the girder in three (3) inch high block letters near each abutment, to be clearly visible from the ground below. In order to

ensure uniformity, abbreviations shall be approved by the Engineer prior to application of the stenciled information.

Method of Measurement: This item, being paid for on a lump sum basis for each site, will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for “Abrasive Blast Cleaning and Field Painting of Structure (Site No. X)”, which price shall include all materials, equipment, painting overspray containment enclosure, heating devices, tools, labor, and services of the technical advisor. No direct payment will be made for the cost of storage or hauling the paint and other materials to and from the bridge site, but the cost thereof shall be included in the lump sum price as noted above.

<u>Pay Item</u>	<u>Pay Unit</u>
Abrasive Blast Cleaning and Field Painting of Structure (Site No. X)	L.S.

Comment [TLT2]: Ownership of this special provision lies with the Office of Construction - Contact Robert Obey, 860-823-3249 or email at robert.obey@ct.gov

ITEM #0603XXXXA - CLASS 1 CONTAINMENT & COLLECTION OF SURFACE PREPARATION DEBRIS (SITE NO. X)

Comment [JLM1]: This Special Provision is OWNED by the Office of Construction - Contact Robert Obey, 860- 823-3249 or email at robert.obey@ct.gov

Description: Work under this item shall consist of furnishing and erecting SSPC Guide 6 Class 1 containment enclosures with negative air pressure as required to contain and collect debris resulting from the removal of coatings in the preparation of steel surfaces for painting. Also included are the vacuum collection and the storage of debris in suitable containers.

The containment and collection of debris shall be done in strict conformance with current Federal Environmental Protection Agency (EPA) and Connecticut Department of Energy and Environmental Protection (DEEP) regulations.

Materials: Materials and equipment shall be of satisfactory quality to perform the work and shall not be used on the project until and unless they have been reviewed and approved by the Engineer.

Rigid walls for the containment enclosure shall be comprised of plywood panels or corrugated panels of steel, aluminum or reinforced fiberglass. Flexible containment walls constructed of fire retardant tarpaulin material shall be impermeable to air and water.

Fifty Five (55) gallon barrels with resealable lids, or lined storage containers sized for the job shall be leakproof; shall conform to the Code of Federal Regulations Title 49, Chapter 1, Paragraph 173.510A (1), (5), and Paragraph 178.118; and shall not be used on the project until and unless they have been reviewed and approved by the Engineer.

In meeting the requirements of these specifications, the Contractor shall supply portable battery-operated manometers with a pressure range of -1.00 to 10.00 and increments of 0.01 inches of water and a velocity range of 50 to 9990 feet per minute; and one or more portable lightmeters with a scale of 0.0-50.0 foot candles.

Construction Methods: The Contractor shall proceed with one of the following containment methods: A. Containment enclosure with a suspended platform, B. Containment enclosure without a suspended platform.

A. Containment enclosures with a suspended platform:

At least two months prior to any abrasive blast cleaning activities, the Contractor shall submit to the Department (10) complete copies of detailed working drawings and calculations prepared and stamped by a Professional Engineer (Mechanical and Civil) licensed in Connecticut, which drawings shall detail as described below, the proposed methods for such activities. The Contractor shall not commence with containment enclosure erection and abrasive blast cleaning until and unless the working drawings have been reviewed and approved by the Engineer, and shall proceed with such work only within approved containment enclosures.

The working drawings shall include the following:

1. A construction plan and drawings detailing proposed coating removal operations, abrasive debris classification and separation, removal and transport of waste to a secure storage site.
2. A plan and drawings detailing the proposed containment enclosure, including details of the following:
 - A. Rigid, solid floor or platform.
 - B. Containment walls with rigid and flexible materials.
 - C. Rigid supports and bracing for the floor and wall panels, rigid or flexible supports and bracing for flexible walls.
 - D. Calculations including localized overstress conditions, member stresses, H.S. load rating and maximum dead and live load imposed on the bridge by the containment enclosure, grit blasting/recycling equipment and HVAC equipment.
 - E. Maximum allowable load for the floor/platform.
 - F. Wind load and wind stresses imposed on the bridge by the containment enclosure shall be calculated and submitted.
 - G. Airflow and air re-circulation within the enclosure including a minimum negative pressure of 0.03 in. of water column (W.C.) relative to external ambient air and calculations. Airflow shall meet the SSPC Guide 6 requirements of 100 ft/min cross draft and 50 ft/min downdraft and the OSHA Ventilation Standards. The maximum cross sectional area for airflow within the enclosure shall be 400 square feet.
 - H. Connections to the bridge, i.e., clamps, rollers. (Note: Welding and bolting is not allowed.) Each connection to the bridge shall have a tension load cell attached. A multi-channel digital load indicator shall be connected to all the bridge connection load cells and located in an area accessible to the Engineer. The load indicator shall be capable of storing peak load readings.
 - I. Auxiliary stationary source lighting.
 - J. Dust collection and filtration equipment, including the equipment data sheets and airflow capacity.
 - K. Air intake points including filters, louvers, baffles, etc.
 - L. Entrance/Exit compartment completely sealed with airlocks.
 - M. Location of equipment and impact on traffic.
 - N. Elevation view of the containment enclosure with indications of any encroachments on the surroundings. The bridge vertical clearance shall be maintained throughout the project.

NOTE: The structure loading for containment design shall be in accordance with AASHTO using HS-20 loads. The allowable overstress for all conditions shall not exceed 20%.

Comment [M2]: Review HS-20 criteria 3/1/13

B. Containment enclosures without a suspended platform:

At least two months prior to any abrasive blast cleaning activities, the Contractor shall submit to the Department (10) complete copies of detailed working drawings and calculations prepared and stamped by a Professional Engineer (Mechanical and Civil) licensed in Connecticut, which

drawings shall detail as described below, the proposed methods for such activities. The Contractor shall not commence with containment enclosure erection and abrasive blast cleaning until and unless the working drawings have been reviewed and approved by the Engineer, and shall proceed with such work only within approved containment enclosures.

The working drawings shall include the following:

1. A construction plan and drawings detailing proposed coating removal operations, abrasive debris classification and separation, removal and transport of waste to a secure storage site.
2. A plan and drawings detailing the proposed containment enclosure, including details of the following:
 - A. Containment walls with rigid and flexible materials.
 - B. Rigid supports and bracing for the floor and wall panels, rigid or flexible supports and bracing for flexible walls.
 - C. Airflow and air re-circulation within the enclosure including a minimum negative pressure of 0.03 in. of water column (W.C.) relative to external ambient air and calculations. Airflow shall meet the SSPC Guide 6 requirements of 100 ft/min cross draft and 50 ft/min downdraft and the OSHA Ventilation Standards. The maximum cross sectional area for airflow within the enclosure shall be 400 square feet.
 - D. Connections to the bridge, i.e., clamps, rollers. (Note: Welding and bolting is not allowed.)
 - E. Auxiliary stationary source lighting.
 - F. Dust collection and filtration equipment, including the equipment data sheets and airflow capacity.
 - G. Air intake points including filters, louvers, baffles, etc.
 - H. Entrance/Exit compartment completely sealed with airlocks.
 - I. Location of equipment and impact on traffic.
 - J. Elevation view of the containment enclosure with indications of any encroachments on the surroundings. The bridge vertical clearance shall be maintained throughout the project.

In addition, if the bridge vertical clearance is greater than 30 feet, the wind load and wind stresses imposed on the bridge by the containment enclosure shall be calculated and submitted.

Reference information on enclosures can be obtained from the following sources:

- SSPC Guide 6
- Steel Structures Painting Manual, Volume 1.
- NCHRP Report 265

The containment enclosure shall be sealed across the bridge deck underside between the girders with a rigid material. The floor shall be covered with a waterproof tarpaulin attached and sealed to the enclosure wall and floor around the entire enclosure perimeter. All edges of tarpaulins shall have

a two-foot flap that clamps over the connected edges around the entire perimeter. These flaps shall be completely fastened 12 in. on center for both edges and sealed completely with the tarpaulin manufacturer's recommended tape and caulk.

All equipment placement and work shall be in strict conformance with the contract special provisions "Prosecution and Progress" and "Maintenance and Protection of Traffic". The Contractor shall perform all work in accordance with the requirements of any permits for this project.

During abrasive blast cleaning, if the containment enclosure is allowing debris to escape, the Contractor shall immediately stop such work until the enclosure is repaired. Any debris released from the enclosure shall be cleaned up by the Contractor immediately.

The containment enclosure shall be disassembled if the wind velocity is greater than 40 miles per hour, if it is forecast to be higher or when directed by the Engineer. However, if the wind velocity is below 40 MPH, but high enough to cause the containment enclosure to billow and emit dust, the Contractor shall immediately cease abrasive blast cleaning and, after cleaning up all the debris, disassemble the enclosure.

All debris resulting from surface preparation shall be contained and vacuum collected daily or more frequently as directed by the Engineer, due to debris buildup. Such debris, abrasive blast residue and paint chips removed by hand or power tool cleaning, shall be stored in leakproof storage containers in the secured storage site, or as directed by the Engineer. Debris storage shall be in accordance with Connecticut Hazardous Waste Management Regulations.

If 55 gallon barrels are used, staging is required: 55 gallon barrels shall be stored together in two rows of five. The Contractor shall maintain a minimum lane clearance of 36 inches between each (barrel lot of ten).

The Contractor shall maintain a secure storage site, which shall be large enough to handle all coating debris that is collected and stored on site at any time. The Contractor shall store coating debris only in the secured storage site. During abrasive blast cleaning operations, all surface preparation debris shall be vacuum collected from the containment enclosure and removed to the abrasive recycling reclaimer unit, and the coating debris shall be conveyed to the secured storage site at the conclusion of the work shift. The Contractor shall account for all coating debris conveyed to the secured storage site and all coating debris transported from the project to the hazardous waste treatment/disposal facility. The Contractor is responsible for the proper handling of the surface preparation debris and coating debris. All spillage shall be cleaned up immediately.

The secure storage site shall consist of an 8-ft. high fenced-in area with a padlocked entrance. Storage containers shall not be used on the project until and unless they have been reviewed and approved by the Engineer. Storage containers and sites shall be located so as not to cause any traffic hazard. Container storage sites shall be in areas that are properly drained and runoff water shall not be allowed to pond. The containers shall be placed on pallets or other approved material and not directly on the ground.

Storage containers shall be closed and covered with a waterproof tarpaulin at all times except during placement, sampling, and disposal of the debris.

The Contractor shall furnish the inspector with two (2) new portable battery-operated manometers and light meters, per containment enclosure. Negative pressure verification with the portable manometers shall be done by the Engineer before and during abrasive blast cleaning and during vacuum collection of all surface preparation debris. The supplied instruments will become the property of the State upon job completion.

Light at the steel surface within the enclosure shall be maintained by the Contractor at a minimum of 50 foot-candles as measured by a light meter. Such lighting shall be maintained throughout the surface preparation, painting, and inspection activities.

Equipment noise in excess of 90 decibels as measured at the closest residential, commercial or recreational areas, shall be lowered by the Contractor to a maximum of 90 decibels by the use of mufflers or other equipment approved by the Engineer prior to its use for this purpose.

Any air exhausted from the containment enclosure, abrasive-recycling equipment or vacuum equipment shall be passed through a filtering system. The Contractor is responsible for the design, effectiveness and maintenance of this filtering system. No discharge of debris dust shall be allowed.

The Contractor is liable for any fines, costs, or remediation costs incurred as a result of their failure to be in compliance with this special provision and all Federal, State, and local laws.

Method of Measurement: Work under this item will not be measured for payment, but will be paid for at the contract lump sum price for each site. A site shall consist of an entire bridge structure, unless otherwise noted on the plans.

Basis of Payment: This work will be paid for at the contract lump sum price for "Class 1 Containment and Collection of Surface Preparation Debris (Site No. X)", at the site designated. The price shall include all materials, equipment, tools, labor and work incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Class 1 Containment and Collection of Surface Preparation Debris (Site No. X)	L.S.

Comment [JLM3]: This Special Provision is OWNED by the Office of Construction - Contact Robert Obey, 860-823-3249 or email at robert.obey@ct.gov