

## **SECTION 561**

### **COATING EXISTING STRUCTURAL STEEL**

#### **561-1 Description.**

Coat existing structural steel in accordance with the requirements of this Section by removing and replacing the existing coating or overcoating the existing coating as stated in the Contract Documents.

#### **561-2 Materials.**

**561-2.1 Coating Systems:** For removal and replacement systems, use coating products and systems meeting the requirements of Section 975 and are listed on the Department's Approved Product List (APL).

For overcoating systems, use products and systems as designated in the Contract Documents. Submit product data sheets and product Material Safety Data Sheets (SDS), or in lieu of SDS, submit test reports showing percent weight compositional analysis, Chemical Abstract Number, American Conference of Governmental Industrial Hygienists (ACGIH) time weighted average and ceiling exposure limits for all components, and lower and upper explosive limits, flash point, boiling point, amount of volatile organic compounds by weight, and specific gravity for each component of the coating system.

**561-2.2 Thinners, Solvents and Cleaners:** Meet the requirements of 560-2.2. In addition, for overcoating systems, use thinners, solvents, and cleaners that do not damage the existing coating system.

**561-2.3 Caulking:** Meet the requirements of 560-2.3.

**561-2.4 Soluble Salts Test Kit:** Meet the requirements of 560-2.4.

**561-2.5 Abrasives:** Meet the requirements of 560-2.5.

**561-2.6 Rust Preventative Compound:** Meet the requirements of 560-2.6.

**561-2.7 Storage:** Meet the requirements of 560-2.7.

#### **561-3 Equipment.**

**561-3.1 Compressed Air:** Meet the requirements of 560-3.1.

**561-3.2 Abrasive Blasting System:** Meet the requirements of 560-3.2.

**561-3.3 Coating Application System:** Meet the requirements of 560-3.3.

#### **561-4 Quality Control (QC).**

**561-4.1 Field Preparation and Application:** Provide a current Corporate Q C Plan approved by SSPC under the SSPC QP1 and SSPC QP2 certifications as appropriate and a site specific Coating Plan to the Engineer at least 14 calendar days prior to beginning coatings work. Do not begin coatings work until the site specific Coating Plan has been approved by the Engineer.

Prepare a traffic control plan for each phase of construction activities signed and sealed by the Contractor's Engineer of Record in accordance with the Roadway Plans Preparation Manual. Do not begin work until the traffic control plan is approved by the Engineer. Maintain traffic in accordance with Section 102.

For work over navigable waters, submit a work plan to the United States Coast Guard including any scheduled restrictions to navigation channels or marine traffic. Obtain Coast Guard approval at least 30 days in advance of any restrictions.

**561-4.2 Inspection:** Meet the requirements of 560-5.3.

## **561-5 Qualifications.**

**561-5.1 Field Contractor:** Meet the requirements of 560-6.2.

**561-5.2 Quality Control (QC) Inspectors:** Meet the requirements of 560-6.3.

**561-5.3 Certifications:** Meet the requirements of 560-6.4.

## **561-6 Surface Preparation.**

**561-6.1 General:** When portions of the existing coating are designated in the Contract Documents to be removed and replaced, clean, wash, test and remove soluble salts, and abrasive blast or hand and power tool clean to remove all existing coating and corrosion in the intended locations. Feather back the edges of all existing coating to remain a minimum of 3 inches around the area of existing coating removed to provide a smooth transition. Verify the edges of the existing coating are intact by probing with a dull putty knife in accordance with SSPC SP 2. Roughen the existing coating in the feathered area to ensure proper adhesion of the new coating. Notify the Engineer immediately when any structural steel appears to be defective.

When the existing coating is to remain, clean, wash, and test and remove soluble salts.

Ensure all surfaces to be coated are clean, dry, and free from oil, grease, dirt, dust, soluble salts, corrosion, peeling coating, caulking, weld spatter, mill scale and any other surface contaminants. Sequence the surface preparations and coating operations so that freshly applied coatings will not be contaminated by dust or foreign matter. Protect all equipment and adjacent surfaces not to be coated from surface preparation operations. Protect working mechanisms against intrusion of abrasive. In the event that any rusting or contamination occurs after the completion of the surface preparation, prepare the surfaces again to the initial requirements. Perform surface preparation work only when the temperature of the steel surface is at least 5°F above the dew point temperature.

**561-6.2 Mechanical Removal of Surface Defects:** Meet the requirements of 560-7.2. In addition, remove all pack rust prior to solvent cleaning.

**561-6.3 Cleaning:** Meet the requirements of 560-7.3.

**561-6.4 Washing:** Meet the requirements of 560-7.4.

**561-6.5 Soluble Salts Detection and Removal:** Meet the requirements of 560-7.5 except test five random locations in the first 1000 square feet and one random location for each subsequent 1000 square feet.

**561-6.6 Abrasive Blast Cleaning:** Meet the requirements of 560-7.6.

**561-6.7 Hand and Power Tool Cleaning:** Prepare steel by power and hand tool cleaning as defined in SSPC SP 11, SSPC SP 3, and SSPC SP 2 as stated in the Contract Documents. Use SSPC VIS 3 as an aid in establishing cleanliness.

## **561-7 Surfaces Not to be Coated.**

**561-7.1 Galvanized Surfaces:** Meet the requirements of 560-8.1.

**561-7.2 Machine Finished Surfaces:** Meet the requirements of 560-8.4.

## **561-8 Application.**

**561-8.1 General:** Apply a complete coating system to all structural steel surfaces except surfaces indicated in 561-7.

Prior to the application of any coating, inspect the substrate for contamination and defects, and prepare the surface in accordance with 561-6 before application of the next coat.

Apply each coat including a stripe coat in a color that contrasts with the substrate or preceding coat. For exterior surfaces, apply a finish coat color meeting FED-STD-595, Shade 36622, unless otherwise specified in the Contract Documents.

**561-8.2 Weather and Temperature Limitations:** Meet the requirements of 560-9.2.

**561-8.3 Sealing Using Caulk:** Meet the requirements of 560-9.3.

**561-8.4 Protection of Adjacent Surfaces:** Meet the requirements of 560-9.4.

**561-8.5 Mixing and Thinning:** Meet the requirements of 560-9.5.

**561-8.6 Application Methods:** Meet the requirements of 560-9.6.

**561-8.7 Stripe Coating:** Meet the requirements of 560-9.7.

**561-8.8 Thickness of Coats:** Meet the requirements of 560-9.8.

**561-8.9 Coating Drying, and Curing:** Apply coatings within the time specified by the coating manufacturer's product data sheet for drying and recoating. Before handling, test for cure in accordance with the manufacturer's recommended method. Meet the requirements of ASTM D5402 for organic zinc primers when the manufacturer's technical data sheet does not state a specified cure test. Obtain the acceptance criteria from the coating manufacturer and report the results to the Engineer.

**561-8.10 Coating Finish:** Meet the requirements of 560-9.10.

### **561-9 Touchup and Repair.**

Clean and coat all welds, rivets, bolts, and all damaged or defective coating and rusted areas in accordance with 561-6 and 561-8. Upon approval by the Engineer, aluminum mastic may be used in accordance with the manufacturer's recommendations. Aluminum mastic must contain aluminum pigment and minimum 80% volume solids.

### **561-10 Protection of the Environment, Public, and Workers.**

**561-10.1 General:** Establish plans and programs to protect the environment, public, contractor employees, other workers, and property from overspray, exposure to toxic heavy metals and the release and emission of hazardous materials and nuisance dusts. Include in such plans and programs a procedure for the receipt, processing, evaluation and timely written response for claims by the public for damage resulting from the foregoing work. Provide the Department with copies of any written response which denies such damage claims. Conduct all coating application and removal operations in compliance with EPA, OSHA, and other applicable Federal, State and local regulations. Provide a contingency plan for the remediation of water and land in the event of contamination by solid or liquid paint and contaminated water.

**561-10.2 Environmental Protection:** Prepare and submit to the Engineer, plans and programs for the protection of the environment and public based on the applicable EPA requirements, the requirements of this Section, and the Contract Documents. Include plans and programs for the protection of the air, soil/ground, and water.

**561-10.2.1 Pollution Control:** Submit a written pollution control and monitoring plan at the preconstruction meeting or as directed by the Engineer which clearly describes the means for complying with all Local, State and Federal regulations including pollution control provisions specified herein. The written plan must be in accordance with SSPC Project Design: Industrial Lead Paint Removal Handbook, Volume II, Phase 6, Environmental Monitoring, and specifically include, but not be limited to, providing a scaled map of the work site layout showing the proposed number and location of soil sampling, Total Suspended Particulate (TSP) monitoring sites, waste storage areas, staging areas, temporary waste storage areas, and ambient air and personnel sampling frequency.

Comply with all applicable Federal, State, and Local rules and regulations. Immediately cease all operations in the event a violation of any environmental regulation or a failure to properly execute any pollution control provisions occurs. Resume operations after written proposed corrective procedures have been submitted to and approved by the Engineer and implemented.

**561-10.2.2 Permits:** Submit all required permits from all applicable regulatory agencies to the Engineer prior to the commencement of any work. Seek permit determination from these regulatory agencies to avoid any potential permit non-compliance issues during work activities. The Contractor is responsible for all liability resulting from non-compliance with pertinent rules and regulations including permit requirements.

**561-10.2.3 Ambient Air Quality Compliance and Protection of the Air:**

**561-10.2.3.1 Visible Emissions:** Assess the visible emissions using EPA Method 22, Timing of Emissions as defined by 40 CFR 60, Appendix A, Standards of Performance for New Stationary Sources. During abrasive blasting, do not allow visible emissions from a containment to exceed a random cumulative duration of more than one percent of the workday (SSPC Guide 6, Level 1 Emissions). During pressurized water cleaning, do not allow visible emissions from a containment to exceed a random cumulative duration of more than ten percent of the workday (SSPC Guide 6, Level 3 Emissions).

**561-10.2.3.2 Total Suspended Particulate (TSP) Matter:** Control emissions from the containment area to prevent exceeding the TSP lead of  $1.5 \mu\text{g}/\text{m}^3$  over a 90 day period, or the daily and adjusted daily allowances of SSPC-TU 7. Conduct TSP Lead monitoring in accordance with 40 CFR 50, Appendix B, Reference Method for Determination of TSP Matter in the Atmosphere (high volume sampler required), and 40 CFR 50, Appendix G, Reference Method for Determination of TSP Matter Collected from Ambient Air. Position the TSP lead monitoring equipment in general accordance with 40 CFR 58, Ambient Air Quality Surveillance.

When lead is present in the coating, perform TSP Lead background monitoring for a period of 3 days prior to the beginning of abrasive blast cleaning operations. Submit the results from background monitoring and the first week of monitoring during abrasive blast cleaning to the Engineer for review within 5 calendar days after the first week of work. Continue monitoring unless otherwise directed by the Engineer.

**561-10.2.3.3 Regulated Area:** Establish a regulated area around the work site to prohibit unauthorized persons from areas where exposure to hazardous airborne metals may exceed the following action levels:

Airborne Metals	Action Level
Lead	$30 \mu\text{g}/\text{m}^3$
Cadmium	$2.5 \mu\text{g}/\text{m}^3$
Arsenic	$5 \mu\text{g}/\text{m}^3$
Hexavalent Chromium ( $\text{Cr}^{6+}$ )	$2.5 \mu\text{g}/\text{m}^3$

Conduct monitoring in accordance with the National Institute for Occupational Safety and Health (NIOSH) procedures upon initiation of dust producing operations and submit the test results to the Engineer within 72 hours of sampling. Report sample results as eight-hour Time Weighted Averages (TWA). Reestablish the regulated area and perform additional sampling when the results exceed the action levels or when directed by the

Engineer. Document all pertinent data in a field logbook. Position air-sampling pumps around the project perimeter where the public or personnel can approach the work area. Place sampler inlets at breathing height. Clearly mark the regulated area by the use of warning signs, rope, barrier tape, or temporary construction fencing.

**561-10.2.4 Soil/Ground Quality:** Inspect the ground beneath and in proximity to the structure in the presence of the Engineer for visible paint chips to establish an initial job site cleanliness standard. When heavy metals are in the existing coatings, test soil samples prior to the beginning of operations and after project completion for heavy metals. Document the number and specific locations where the initial samples are taken as outlined in the SSPC Project Design-Industrial Lead Paint Removal Handbook, Volume 2 to ensure the post samples are collected from the same locations. Submit all samples to the Engineer for review. If the project activities increase the heavy metal content in soil to more than 20% above the pre-job geometric mean or 100% at any one location, return the site to the pre-job levels. Conduct additional soil testing as necessary to determine the extent of contamination.

For structures less than 14 feet minimum height, take one sample north, south, east, and west (where soil is present) of the structure. If the structure is longer than 14 feet, take one additional sample for every 14 feet in length.

For structures greater than 14 feet minimum height, take two samples north, south, east, and west (where soil is present) of the structure. Locate the inner row of samples within 14 feet of the structure. Locate the outer row of samples at a distance equal to the height of the structure. If the structure is longer than 14 feet, take one additional sample for every 14 feet in length.

In addition, submit a pre- and post- soil sampling plan for storage areas identifying the sample location, depth, analyses list, lab certification, and turnaround time. Once approved by the Engineer, submit sampling results along with a scaled drawing indicating designated sample locations.

**561-10.2.5 Water Quality:** Do not release, discharge or otherwise cause hazardous materials, debris, waste, or paint chips to enter the water. Protect against releases due to rain and methods of surface preparation from reaching rivers, streams, lakes, storm drains, or other bodies of water.

**561-10.3 Containment System:** Submit a written containment system design plan in accordance with this section and the contract documents at the pre-construction conference or as directed by the Engineer which clearly describes the proposed containment system applicable to the intended removal method and in accordance with the requirements outlined herein and SSPC Guide 6, Guide for Containing Debris Generated During Paint Removal Activities. Ensure the plan includes, but is not limited to, removal method; methods for collecting debris; and containment enclosure components. Use fire retardant materials. Provide containment drawings, calculations, assumptions, ventilation criteria if applicable, and a structural analysis that verifies the existing structure can withstand the additional dead, live and wind loads imposed by the containment system, signed and sealed by a Specialty Engineer. However, for more complex structures incorporating cables stayed, suspension, or truss designs, the analysis must be performed by the Contractor's Engineer of Record qualified in Type Work Category 4.3, Complex Bridge Design. Provide a contingency plan addressing natural weather events such as tropical storms and hurricanes. Ensure the lighting inside the containment is in accordance with SSPC Guide 12, Guide for Illumination of Industrial Painting Projects. Provide lighting to a minimum intensity of 10 ft-cd for general, 20 ft-cd for work, and 50 ft-cd for inspection. All

drawings and calculations must be submitted and accepted before any work begins. Include a clear description of the ventilation system components and information including the fan curve and design point on the proposed dust collector. Design to provide ventilation according to the notes provided in SSPC Guide 6: 100 feet per minute for cross draft and 50-60 feet per minute for downdraft.

Isolate the immediate area of the structure to ensure compliance with current and permit requirements for air, water, soil, and pollution prevention. Protect the containment system from vehicular and pedestrian traffic. Ensure paint, paint chips, or other debris will not fall outside of the containment area under any circumstances. Repair any damage created by fastening, bracing, or handling the scaffolding and staging. If a suspended platform is constructed, use rigid or flexible materials as needed to create an air and dust impenetrable enclosure. Verify that the platform and its components are designed and constructed to support at least four times its maximum intended load without failure, with wire cables capable of supporting at least six times their maximum intended load without failure. Strictly comply with all applicable OSHA regulations regarding scaffolding. The category and class of containment shall be as required in the Contract Documents.

**561-10.4 Protection of Adjacent Areas:** Protect all areas adjacent to abrasive blast cleaning, including machinery and deck grating. Before the commencement of any cleaning and coating operations, provide a control plan for the protection of adjacent surfaces from damage by nearby blasting and coating to the Engineer for review. Repair any damage to adjacent areas. The repair procedure must be submitted to the Engineer for acceptance prior to any remediation.

**561-10.5 Worker Protection:** Comply with the requirements of OSHA 29 CFR 1926 and applicable portions of 29 CFR 1910. Include specific programs as required by 29 CFR 1926.62 (lead), 29 CFR 1926.1118 (inorganic arsenic), 29 CFR 1926.1126 (hexavalent chromium), and 29 CFR 1926.1127 (cadmium) when these hazardous agents are present. Implement appropriate safety procedures for all hazards on the job site whether specifically identified herein or not.

## **561-11 Waste Handling and Management.**

**561-11.1 General:** Prepare a waste management program plan which addresses the applicable requirements from EPA regulations for hazardous waste management and the Contract Documents. Include provisions for the handling and disposal of non hazardous waste. Dispose of all waste in accordance with all federal, state, and local laws and regulations.

**561-11.2 Collection and Handling of Waste:** Properly classify, package, and store all paint removal debris, both solid and liquid in accordance with SSPC Guide 7, Guide for the Disposal of Lead-Contaminated Surface Preparation Debris, the Federal Water Pollution Control Act with amendments, and all other current government regulations and guidelines. Comply with the Resource Conservation and Recovery Act to include, at a minimum, CFR 40 260 through CFR 40 268. Prior to identification and storage, separate solid and liquid waste, and separate individual waste streams.

**561-11.3 Testing and Analysis:** Laboratory analyses for all waste stream and environmental samples shall be conducted by an EPA certified, independent laboratory with an approved Quality Assurance Plan. Laboratory analyses for worker monitoring and regulated area samples shall be conducted by an American Industrial Hygiene Association (AIHA) metals accredited laboratory. Provide a copy of all sampling and test reports no later than 72 hours after collection of samples.

**561-11.4 Waste Identification:** Collect samples in accordance with EPA SW 846, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods. Use a random and representative sampling technique. Collect a minimum of four representative samples of each waste stream. These waste streams include, but are not limited to, water, paint chips, dust, and paint chips mixed with disposable abrasives and debris. Complete the initial sampling of each waste stream immediately upon filling the first drum, but do not allow waste to accumulate for longer than 7 days before sampling.

After the representative samples are collected, send them immediately to the EPA certified laboratory for analysis. Unless otherwise directed by the Engineer, required by State regulations, or required by the waste recycling or disposal facility, once each waste stream is sampled, tested, and classified, additional sampling and analysis are not required for subsequent shipments unless the waste stream changes. Submit samples to an approved laboratory to be tested for arsenic, barium, cadmium, hexavalent chromium, lead, mercury, selenium, and silver in accordance with EPA Method 3050 and Method 6010 (content) and EPA Method 1311, Toxicity Characteristics Leaching Procedures (TCLP). Clearly label each sample with sample number, date and time of sampling, name of collector, and location of collection.

Maintain chain of custody forms for each sample. Enter each sample on a sample analysis request form. Enter sample numbers, type of waste, amount of each sample, distribution of samples, signature and all other information into field logbook.

**561-11.5 Waste Storage:** Collect waste from the control devices, equipment, and all work surfaces on a daily basis. Keep hazardous and non-hazardous waste separate. Do not mix blasting debris with any other type of waste. Place waste in approved storage drums.

Locate all hazardous waste within a regulated area. The maximum weight for each drum, when filled, is 821 pounds. Properly seal and label all drums. Transport waste storage drums to a secured, marked, temporary storage area. Locate the temporary storage area on well-drained ground not susceptible to flooding or storm water run-off. Place drums on a pallet and cover with fiber reinforced, impermeable tarpaulins. Store drums no more than two drums wide and two drums high. Arrange drums so that labels are easily readable. Do not store waste in the temporary storage area longer than 90 days.

**561-11.6 Waste Disposal:** Transport, treat and dispose of all hazardous and non-hazardous waste. Notify the Engineer a minimum of three weeks prior to the date of shipment of any waste to an off-site facility. Provide the Engineer with documentation that the receiving disposal facilities are properly licensed. Provide manifests for all hazardous and non-hazardous waste shipments. Identify any waste disposal subcontractors and provide a copy of their licensing to perform waste disposal and transport operations.

**561-11.7 Permits:** The Contractor is responsible for all liability resulting from non-compliance with pertinent rules and regulations including permit requirements.

## **561-12 Method of Measurement.**

When a lump sum pay item is provided, the quantity to be paid for coating existing structural steel will be the lump sum quantity for the areas shown in the Plans, completed and accepted.

When a square foot item is provided, the quantity to be paid for coating existing structural steel will be the plan quantity in square feet of surface area as shown in the Plans, completed and accepted.

**561-13 Basis of Payment.**

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

- Item No. 561- 1- Coating Existing Structural Steel - lump sum.
- Item No. 561- 2- Coating Existing Structural Steel - square foot.