

- 39573.1011 - SYSTEM A - ALL COATS APPLIED IN SHOP (SP10/INORGANIC ZINC/EPOXY INTERMEDIATE/URETHANE FINISH)**
- 39573.1012 - SYSTEM A' - SHOP PRIME FIELD INTERMEDIATE/FINISH (SP 10/INORGANIC ZINC/EPOXY INTERMEDIATE/URETHANE FINISH)**
- 39573.1013 - SYSTEM B - TOTAL COATING REPLACEMENT SP10/EPOXY ZINC/EPOXY INTERMEDIATE/URETHANE FINISH)**
- 39573.1014 - SYSTEM B' - TOTAL COATING REPLACEMENT SEALER USED (SP 10/EPOXY ZINC/ SEALER/EPOXY INTERMEDIATE/URETHANE FINISH)**
- 39573.1015 - SYSTEM C - TOTAL COATING REPLACEMENT (SP10/MCU ZINC/MCU INTERMEDIATE/MCU FINISH)**
- 39573.1016 - SYSTEM C' - TOTAL COATING REPLACEMENT SEALER USED (SP10/MCU ZINC/SEALER/MCU INTERMEDIATE/MCU FINISH)**
- 39573.1017 - SYSTEM D - TOTAL COATING REPLACEMENT (SP6/MCU ALUMINUM/MCU INTERMEDIATE/MCU FINISH)**
- 39573.1018 - SYSTEM D' - OVERCOATING (SPOT CLEAN/WASH/MCU ALUM/MCU INTERMEDIATE/MCU FINISH)**
- 39573.1019 - SYSTEM D' - TOTAL COATING REPLACEMENT SEALER USED (SP6/MCU ALUMINUM/SEALER/MCU INTERMEDIATE/MCU FINISH)**
- 39573.1020 - SYSTEM D' - OVERCOATING SEALER USED (SPOT LEAN/WASH/SEALER/MCU ALUM/MCU INTER./MCU FINISH)**
- 39573.1021 - SYSTEM E - OVERCOATING (SPOT CLEAN/WASH/ALKYD PRIMER/ALKYD INTER./SILICONE ALKYD FINISH)**
- 39573.1022 - SYSTEM F - OVERCOATING (SPOT CLEAN/WASH/ALKYD PRIMER/ ALUMINUM ALKYD FINISH)**
- 39573.1023 - CAULKING**

**DESCRIPTION.**

The Special Requirements for the specific project, in conjunction with this Section, establish the project painting requirements. The Special Requirements identify the scope of work for the project, the items to be painted, extent of surface preparation required, the type of coatings to be applied, and unique project requirements. This Section provides the workmanship requirements for conducting the following surface preparation and painting activities:

- Field cleaning and painting of new, bare steel.
- Cleaning and finish painting of shop primed steel.
- Partial removal of existing coatings and overcoating.
- Total removal of existing coatings followed by repainting.

In addition to the requirements of this Section. comply with the instructions provided on any Drawings included with the Contract Documents.

Provide all materials, apparatus, and labor necessary to perform the specified scope of work, whether or not the material or apparatus is specifically identified in this Section.

## GENERAL

The Contractor is responsible for developing and implementing a Quality Control Plan in accordance with the requirements of Appendix A that ensures the satisfactory preparation of surfaces and application of the coatings.

Conduct all surface preparation and painting operations in a workmanlike manner to the satisfaction of the NYCDOT.

Attend a pre job meeting with all appropriate parties (Engineer, Contractor, coating manufacturer, and REI consultant). Arrange for the coating manufacturer to attend the meeting.

Coordinate all painting activities to assure that the prime, intermediate and finish coats of a given system are products of the same paint manufacturer. This includes both shop and field painted steel. Note that when this specification is used for the maintenance of existing paint systems, products produced by the manufacturer of the existing system need not be used unless warranty provisions dictate otherwise.

In the event of a conflict between the manufacturer's technical data and the requirements of this Section, advise the Engineer of the discrepancies in writing, and comply with the Engineer's written resolution.

When the Special Requirements specify that the existing coating being removed contains lead or other toxic metals, implement controls for the protection of workers, the public, and the environment, and for the handling and disposal of the waste. Comply with the requirements of NYCDOT Section 832, Specification for Lead Paint Removal Worker/Environmental Protection and Waste Handling.

## CONTRACTOR QUALIFICATIONS AND SUPERINTENDENCE

Unless otherwise specified in the Special Requirements, the Contractor or painting subcontractor shall possess SSPC QP-1 and QP-2 certifications at the time of bid and throughout the duration of the project.

The Contractor is responsible for supervising and directing the painting work efficiently using the best skills and attention.

Keep an experienced, English speaking competent resident superintendent acceptable to the NYCDOT on the project at all times. The superintendent is the Contractor's representative and must have the authority to act on behalf of the Contractor. All communications given to the superintendent are binding upon the Contractor.

Keep trained and experienced quality control inspector(s) on the project to conduct all of the tests and inspections required to verify and document the quality of all aspects of the Work. Unless otherwise specified in the Special Requirements, the inspectors shall have a minimum qualification of NACE Basic.

## REGULATORY COMPLIANCE

Comply with the requirements of this Section and all applicable Federal, State, and City laws, codes, and regulations, including, but not limited to the regulations of the United States Environmental Protection Agency (USEPA) and Occupational Safety and Health Administration (OSHA), New York State Department of Environmental Conservation (DEC), New York State Department of Health (NYS DOH), New York State Department of Labor (NYSDOL), and the New York City Department of Environmental Protection (NYCDEP). Codes, Rules and Regulations of the State of New York (N-YCRR) are

administered by the NYS Department of Environmental Conservation, Albany, N.Y. EPA regulations are administered by the US Environmental Protection Agency, Region 2, N.Y., N.Y.

Identification of the above items in this specification which are of specific interest to the NYCDOT in no way relieves the Contractor of the responsibility to comply with all applicable legal requirements. Moreover, compliance with Contract specifications does not relieve the Contractor of the obligation to comply with other applicable requirements. If a Federal, State, or City regulation is more restrictive than any of the requirements of this Section, the more restrictive requirements shall apply.

## REFERENCE STANDARDS

### Latest Edition

The latest edition of the following standards and regulations in effect at the time of Contract letting form a part of this Section. In the event of a conflict, comply with the most restrictive requirements. Maintain at the job site, a copy of all applicable reference standards.

### American Society for Testing and Materials (ASTM)

ASTM D 659, Standard Test Method for Evaluating Degree of Chalking of Exterior Paints

ASTM D1400, Standard Test Method for Non Destructive Measurement of Dry Film Thickness of Non Conductive Coatings Applied to a Non ferrous Metal Base

ASTM D3359, Standard Test Methods for Measuring Adhesion by Tape Test

ASTM D4138, Standard Test Method for Measurement of Dry Paint Thickness of Protective Coating Systems by Destructive Means

ASTM D4285, Standard Test Method for Indicating Oil or Water in Compressed Air

ASTM D4414, Standard Practice for Measurement of Wet Film Thickness by Notch Gages

ASTM D4417, Standard Test Methods for field Measurement of Surface Profile of Blast Cleaned Steel

ASTM D4541, Standard Test Method for Pull Off Strength of Coatings Using Portable Adhesion Testers

ASTM D5532, Standard Specification for Micaceous Iron Oxide Pigments for Paint Code of Federal Regulations (CFR)

29 CFR 1910, Occupational Safety and Health Regulations for General Industry

29 CFR 1910.20, Access to Employee Exposure and Medical Records

29 CFR 1910.132, General Requirements for Personal Protective Equipment

29 CFR 1910.133, Eye and Face Protection

29 CFR 1910.134, Respiratory Protection

29 CFR 1910.146, Permit Required Confined Spaces

29 CFR 1926, Occupational Safety and Health Regulations for the Construction Industry

29 CFR 1926.16, Rules of Construction

29 CFR 1926.20, General Safety and Health Provisions

29 CFR 1926.21, Safety Training and Education

29 CFR 1926.28, Personal Protective Equipment  
29 CFR 1926.32, Definition of Competent Person  
29 CFR 1926.51, Sanitation  
29 CFR 1926.52, Noise Exposure  
29 CFR 1926.57, Ventilation  
29 CFR 1926.59, Hazard Communication  
29 CFR 1926.101, Hearing Protection  
29 CFR 1926.104, Safety Belts, Lifelines, and Lanyards  
29 CFR 1926.154, Temporary Heating Devices  
29 CFR 1926.200, Accident Prevention Signs and Tags  
29 CFR 1926.450 454, Scaffolding  
29 CFR 1926.500 503, Fall Protection

Society for Protective Coatings (SSPC)

SSPC SP 1, Solvent Cleaning  
SSPC SP 2, Hand Tool Cleaning  
SSPC SP 3, Power Tool Cleaning  
SSPC SP 5, White Metal Blast Cleaning  
SSPC SP 6, Commercial Blast Cleaning  
SSPC SP 7, Brush Off Blast Cleaning  
SSPC SP 10. Near White Metal Blast Cleaning  
SSPC SP 11. Power Tool Cleaning to Bare Metal  
SSPC SP 12, Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating  
SSPC AB 1, Mineral and Slag Abrasives  
SSPC AB 2, Specification for Cleanliness of Recycled Ferrous Metallic Abrasives  
SSPC PA 2, Measurement of Dry Film Thickness with Magnetic Gages  
SSPC TU 4, Field Methods for Retrieval and Analysis of Soluble Salts on Substrates  
SSPC VIS 1, Visual Standard for Abrasive Blast Cleaned Steel  
SSPC VIS 3, Visual Standard for Hand and Power Tool Cleaned Steel  
SSPC VIS 4(I), Interim Guide and Visual Reference Photographs for Steel Cleaned by Water Jetting New

York State DOT Specifications

NYSDOT Safety Bulletin SB 94 4, Histoplasmosis  
NYSDOT Section 107 05, Safety and Health Plan

City of New York

New York City Noise Control Code  
Noise Control Act of 1972

Equipment and Coating Manufacturers' Published Instructions

SUBMITTALS - See Appendix A.

## **MATERIALS.**

### Abrasives

When abrasive blast cleaning is specified, provide abrasives that are dry and free of oil, grease, and corrosion producing, or other deleterious contaminants. Abrasives containing 1% or greater free silica are not permitted. MSDS or other written information from the abrasive supplier must be provided to demonstrate compliance with this requirement.

Provide abrasives that are sized to produce a sharp, angular, uniform anchor pattern profile height of 1.5 to 3.5 mils (37 to 86 microns). If the requirements of the coating manufacturer differ from this range, provide the recommendations in writing, and comply with the manufacturer's recommendations only upon written approval of the Engineer.

Unless specified otherwise in the Special Requirements, use either expendable or recyclable abrasives. Note that in the case of recyclable abrasives, use steel grit. The sharpness and angularity of the surface profile created by steel shot is not acceptable. Identify the abrasive that will be used in the submittals.

Provide the abrasives to the jobsite in original packaging or in bulk, and store in a clean, dry environment.

### Coatings

Provide the type and quantity of coating materials, thinners, and cleaning solvents needed to paint all surfaces that are identified in the Special Requirements. A listing of coating systems is found in the attached Paint System Tables. The specified products are designated solely as a "standard of quality." Equivalent products may be used as approved by NYCDOT. An equivalent system shall:

Provide comparable or superior corrosion protection, weathering resistance, and color/gloss retention,

Be a standard, regularly produced product of the manufacturer, having been on the market for at least 4 years, and having a sales level of 1000 gallons minimum for each coat during the past year,

Have a minimum of two years successful field exposure on at least two bridge structures in a climate similar to New York City,

Be submitted with product literature and a reference list of bridge painting projects where the system was used, and the name, telephone number and contact person of the bridge owner and Contractor who applied them, and

Be certified by the manufacturer in writing that the coating will perform comparably to the identified materials when applied in accordance with the requirements of this specification.

Use coatings that are compliant with Federal and State and City VOC regulations at the time of application. This includes the use of any required thinners.

Provide a written certification from the manufacturer with each batch of material supplied to the jobsite, stating that the batch represents the same material as on the approved list.

Use the same manufacturer for all coats of a given system on a structure. Unless approved by the Engineer in writing, only use thinners that are supplied by the manufacturer. Do not mix coating products or components of different manufacturers under any circumstances.

Provide each coat of paint in a contrasting color to distinguish it from previously applied or existing coatings. Each coat must completely hide the underlying coat.

The finish color(s) are identified in the Special Requirements. Provide a color sample of the finish coat(s) with the submittals.

Order all paint, thinner, and cleaning materials well in advance of intended use. Maintain an adequate supply of all materials on site at all times so as to not delay the Work.

Provide all paint materials in sealed, original, containers that are properly marked and labeled to allow verification with applicable material safety data sheets, application precautions, and instructions. Verify that the labeling includes the manufacturer's name, type of material, brand name, color designation, shelf life, contract or order number under which the material has been ordered, lot and batch numbers, and quantity.

Note that the Engineer may collect a sample from a jobsite container at random for testing to determine if the jobsite material meets the manufacturer's published product information and the requirements of the Paint Tables. Provide the Engineer with new, clean quart cans and lids for the collection of the samples. If the project material does not meet the product specification, at no cost to the NYCDOT, remove the coating from the jobsite and remove and replace any material from the same batch that has already been applied.

**Caulking** When caulking is specified in the Special Requirements, provide and use material that is approved by the coating manufacturer and the Engineer.

#### CONTAINMENT MATERIALS AND SCAFFOLDING

When removing paints which contain lead or other toxic metals, comply with the containment requirements of NYCDOT Section 832, Specification for Lead Paint Removal Worker/Environmental Protection and Waste Handling.

Supply all materials needed to safely access the steel and to contain paint removal and paint application debris in accordance with the requirements of this Specification and Construction Details. This may include, but is not limited to, ground covers, rigging, scaffolding, planking, containment materials, water booms, boats with skimmers, and all other containment materials that may be needed.

Supply the Engineer with (1) portable light meter with a scale of 9 to 50+ foot candles. The meter will be returned to the Contractor upon completion of the Work.

Do not use any materials until they have been accepted by the Engineer.

#### EQUIPMENT

##### Surface Preparation and Painting Equipment

Provide all brushes, discs, wheels, scrapers, descalers, blast cleaning, and other surface preparation equipment, including vacuum shrouded tools as needed, to conduct the work as specified in this Section and the Special Requirements.

Provide equipment and materials that are clean and sized properly to accomplish the work, including the required surface profile and degree of cleanliness as required by this Section.

Note that each type of equipment must first be demonstrated on site to the satisfaction of the Engineer, and the Engineer must approve the use of the equipment before beginning work. The Engineer also has the authority to rescind the approval of any single piece of equipment if it is found to be not performing properly. Immediately remove rejected equipment from the job site.

Provide paint brushes, rollers, and spray equipment to conduct the work as specified in this Section and the Special Requirements.

Properly maintain all equipment to comply with the New York City Noise Control Code for construction equipment.

#### Personal Protective Equipment

At each site, provide all personal protective clothing and equipment (PPE) needed for Contractor workers to assure that the workers are protected from hazards during all phases of the work. Provide all necessary PPE for NYCDOT employees and NYCDOT Agents (REI Consultants), including proper cleaning and disposal.

Repair or replace PPE as required to assure that it continues to provide its intended purpose.

#### Inspection Equipment

Maintain on site, all of the inspection and testing equipment needed by the Contractor for the quality control of the entire surface preparation and painting process.

Make the following available for use by NYCDOT Employees and Agents involved with the inspection of the surface preparation and coating work. The equipment is the property of the Contractor and will be returned upon completion of the project.

SSPC Volume 1, "Good Painting Practice" and Volume 2, "Systems and Specifications" (1 copy)

Sling psychrometer (2 per active site)

Surface temperature thermometer, 0 to 250°F (2 per active site)

US Weather Bureau Tables or psychrometric chart (2 per active site)

SSPC Vis 1 89 for abrasive blast cleaning projects (2 copies per active site)

SSPC Vis 3 for hand or power tool cleaning projects (2 copies per active site)

SSPC Vis 4 for water jetting projects (2 copies per active site)

Keane-Tator Surface Profile Comparator with appropriate disc for abrasive blast cleaning projects (2 per active site)

Testex Press-O-Film Replica Tape and spring micrometer for abrasive blast cleaning projects (2 rolls of the appropriate range and 1 micrometer per active site)

Wet film thickness gage, notch type of the appropriate range (2 per active site)

Electronic dry film thickness gage with calibration standards (2 per active site)

Tooke Gage (1 per active site)

Portable light meter with a scale of 9 to 50+ foot candles (1 per active site)

Unless stipulated otherwise in the Special Requirements, provide two way radios with telephone capability (one for each inspector and one each for NYCDOT designated senior personnel).

## WASTE CONTAINERS

### Hazardous Waste

Provide DOT approved drums, tanks, roll offs, or other containers of the appropriate size and type in accordance with 49 CFR 178 (e.g., 17H containers in the case of 55 gallon drums) that are suitable for the hazardous waste (liquid and solid) generated on the project. Use containers that are resistant to rust and corrosion (painted, if constructed of steel), that have tight fitting lids or covers, and which are water resistant and leak proof.

Assure that the dry volume capacity of the containers, in cubic yards, is clearly marked on all containers, and that they are labeled as required by applicable Federal, State and City regulatory requirements.

Construction Waste - Provide all containers for non hazardous construction waste. Use containers that are free of loose debris when brought on site.

Spent Solvents - Provide appropriate containers for spent solvents. Containers shall be corrosion resistant and non reactive to the solvents. Review solvent MSDS to ensure compatibility with container materials. Containers shall be labeled in accordance with all applicable federal, state, and City regulations.

## CONSTRUCTION DETAILS

### SAFETY

Conduct all Work in strict accordance with the relevant OSHA 29 CFR 1926 regulations, and the safety and protection requirements stipulated by the equipment and material manufacturers. Develop and implement a Safety and Health Plan as required under NYSDOT Section 107 05, including all associated Special Notes (e.g., Fall Protection Requirements).

Smoking is strictly prohibited in or around any areas where flammable materials are stored or used.

Take special precautions when working in areas where pigeons have nested. Develop and implement a worker protection plan for the inspection and removal of pigeon droppings in accordance with NYSDOT Safety Bulletin SB 94 4 (copy attached as Appendix B). At a minimum, use gloves, whole body protective clothing and a dust respirator while inspecting or removing the debris, followed by thorough washing of hands, face, and forearms before eating, drinking, or smoking.

When removing or disturbing paints containing lead or other toxic metals, comply with the additional specialized measures identified in NYCDOT Section 832, Specification for Lead Paint Removal Worker/Environmental Protection and Waste Handling.

### CONTAINMENT, PROTECTION OF SURFACES, AND RESTITUTION

Contain the surface preparation and painting operations to avoid contamination of surrounding property. Use extreme diligence to assure that vehicles, equipment, hardware, fixtures, and other materials are protected against abrasive impact, paint spillage, overspray, falling objects, and other damage. Make full restitution for damages caused at no additional cost to the NYCDOT.

Requirements for containment when removing paints which contain lead or other toxic metals are found in NYCDOT Section 832, Specification for Lead Paint Removal Worker/Environmental Protection and Waste Handling.

Use protective coverings, shields, or masking as necessary to protect surfaces that are not designated to receive surface preparation or coating, including name plates, electrical equipment, bridge substructure, highway appurtenances, and slope protection.

In the case of shop coated steel, the system consists of an inorganic zinc rich primer, epoxy intermediate, and urethane finish. Provide appropriate masking to prevent the application of the intermediate and finish coats to faying surfaces and to surfaces that will be in contact with poured concrete. Remove all intermediate and finish coat applied to these areas at no cost to the NYCDOT.

Special containment restrictions may be invoked when pressure washing bridges that span a public water supply or span sensitive streams (e.g., trout streams). These restrictions are presented later in this specification under the "Pressure Washing" heading of "Surface Cleaning Requirements."

Maintain all protective coverings during the entire period the work is being performed, and remove all coverings upon completion of the work.

### SCAFFOLDING

Erect all scaffolding and staging required for the work in strict accordance with all OSHA regulations.

Verify that suspended platforms and related components are designed and constructed to support at least 4 times its maximum intended load without failure, with wire cables capable of supporting at least 6 times their maximum intended load without failure.

If the bridge supports the containment or scaffolding system, provide containment drawings, calculations, and assumptions, including ventilation criteria as appropriate, signed and sealed by a Professional Engineer. Do not conduct any work until the drawings, calculations, scaffolding and containment submittals have been reviewed and accepted by the Engineer.

Exercise extreme care in fastening, bracing, and handling the scaffolding and staging to avoid scratching or damaging bridge surfaces and surrounding property and equipment. Remove all scaffolding and staging materials upon project completion. Repair any damage created to the paint, structure, or surrounding property at no cost to the NYCDOT.

## SENSITIVE NATURAL RESOURCES

Sensitive natural resource areas may be located around the project. A sensitive natural resource includes any area capable of providing habitat for plant and animal species or capable of functioning to support environmental systems and maintain the City's environmental balance, such as bays, inlets, and wetlands.

If the project is located in a sensitive natural resource area, develop a site specific habitat protection plan addressing the steps that will be taken to protect these ecologically sensitive areas from damage.

## ENDANGERED SPECIES

Peregrine falcons, barn owls or red tailed hawks may be nesting on the bridge. If present, develop a site specific plan for the sequencing of paint removal operations to avoid disturbing nesting pairs.

Federal and State law permits peregrine falcon nests to be moved if the young have already fledged. Before moving any unoccupied nests, obtain a Federal USF&WS permit and a NYSDEC depredation permit.

Barn owl and red tailed hawk nests are generally occupied from the beginning of April until the end of July, with eggs laid in April. Peregrine falcon nests are generally occupied from March to July.

## NOISE

Comply with the New York City Noise Control Code for construction equipment.

If construction activities will be performed outside of normal hours of operation (7AM to 6PM on weekdays), obtain special permits authorizing this activity. Provide a copy of the permit to the Engineer prior to commencing any operations outside of normal hours.

## TECHNICAL REPRESENTATION BY MATERIAL MANUFACTURER

Arrange for a technical representative of the paint manufacturer(s) to inspect the Work to verify that the surface preparation and coating application as specified and being performed are satisfactory for the coating system(s). Note that the purpose of the manufacturer(s) visits is to confirm that the work is satisfactory for the coating system, and not to recommend a reduction in the level of effort that has been specified.

Unless directed otherwise in the Special Requirements, arrange for manufacturer's inspections at project start up, approximately half way through the project, and upon completion of the Work. Provide the Engineer with a 2 day advance notice prior to each visit.

Have the manufacturer(s) summarize the results of the inspection in writing, together with recommendations. Provide the report to the Engineer within 1 week after each visit.

## SURFACE PREPARATION

### Pre Production Surface Preparation Test Section.

Prior to proceeding with production surface preparation operations, prepare test sections for each of the types of equipment proposed for use, and for each of the specified degrees of cleaning (e.g., SP 10, SP 11,

SP 3, etc.). Select each demonstration site with the approval of the Engineer to represent the unique bridge configurations to be cleaned and the type of material to be removed. Use each of the surface preparation methods and degrees of cleaning in each test area as appropriate. Unless the amount of available steel in the test area does not permit, prepare a minimum of 4 square feet for each method/degree of cleaning.

Prepare the surfaces in accordance with the requirements of the Special Requirements, this Section, and the approved Surface Preparation/Painting Plan provided under "Submittals." Use the same equipment, materials, and procedures for the test section(s) that will be used for the production operations.

Provide safe access for close visual inspection and testing. SSPC-VIS 1 and VIS 3 photographic standards as applicable, may be used as an aid in defining the final surface appearance.

Do not use the equipment or proceed with production surface preparation activities until the Engineer agrees that the test section(s) conform with the cleanliness requirements of this Section. As directed by the Engineer, once the production work begins, remove and replace the equipment that is not performing properly.

Photograph the test areas and coat them with a clear urethane to preserve the level of cleaning for future reference. Use the approved test sections together with the written surface preparation specifications as the standard of cleaning for the project. In the case of conflict between the written definitions and the test sections, the written definitions prevail.

Removal of Existing Debris - Remove and properly dispose of accumulated cinders, dirt, and debris from all areas to be prepared and painted prior to undertaking surface cleaning or surface preparation operations. Note that the removal of pigeon droppings requires special considerations as outlined earlier in this Section.

#### Weld Spatter, Sharp Edges, and Holes

Remove slag, flux deposits, and weld spatter on new steel. Grind any resulting burrs smooth, including burrs around holes.

Prior to the preparation of new steel, break all flame cut and sheared edges. Break the edges to an approximate 1/16" chamfer prior to surface preparation. The rolled edges of angles, channels, and wide flange beams do not normally require further rounding.

Remove the surface of flame hardened steel to the extent necessary to achieve the specified profile during subsequent blast cleaning or power tool cleaning.

#### Removal of Rust Scale and Pack Rust

Remove all rust scale and loose pack rust. Unless indicated otherwise in the Special Requirements, remove tight pack rust until the highest point is a minimum of 1/8" below the surface of the surrounding sound steel. Pack rust that can not be removed by prying and probing with a dull putty knife is considered to be adherent.

Pay particular attention to the crevice areas at steel connection points when removing pack rust and rust scale.

Exercise extreme care to avoid nicking or gouging the steel during removal. Nicks and gouges are cause for a suspension of activities until appropriate adjustments are made to prevent a reoccurrence.

#### Steel Defects

Immediately report to the Engineer any cracks or significant metal loss found in the structural steel.

Provide the Engineer with access to the suspect areas as needed to conduct an investigation.

#### Compressed Air Cleanliness

Provide compressed air that is free from moisture and oil contamination.

Conduct a white blotter test in accordance with ASTM D4285 to verify the cleanliness of the compressed air. Conduct the test at least once per shift for each compressor system. Sufficient freedom from oil and moisture is confirmed if soiling or discoloration are not visible on the paper.

If air contamination is evidenced, change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air.

Ambient Conditions - Do not conduct final surface preparation which exposes bare steel under damp environmental conditions, or when the surface temperature is less than 5°F greater than the dew point temperature of the surrounding air.

Surface Cleaning Requirements - Steel Substrates - The Special Requirements and attached Paint System Tables identify the degree of cleaning required for the coating systems used on the project. Apply the specified degree of cleaning to all designated surfaces with the exception of specifically defined limited access areas. Provide "best effort" surface preparation in areas defined by the Engineer as presenting limited accessibility for thorough cleaning. The definition of limited access and acceptance of the reduced quality of preparation is left to the sole discretion of the Engineer. Definitions for the specified degree(s) of cleaning are provided below:

#### Water Washing/Scrubbing of Cables

Use low pressure water (<150psi) and stiff bristled non metallic scrub brushes to hand clean the exterior of the cables. Provide product data and MSD sheets for Engineer review and approval for any proposed additives that will be used to remove grease, dirt, mildew or other surface matter.

Provide a surface, which when viewed without magnification, is free of all visible dirt, chlorides, oil, grease, mildew, chalk, bird droppings, or other foreign matter. Wipe a cloth of contrasting color across the surface at random. Unless otherwise directed by the Engineer, clean the surface until an ASTM D 659 chalk rating of 8 or better is obtained.

Comply with the water collection criteria described below under Pressure Washing.

#### Pressure Washing

Use Low Pressure Water Cleaning (LP WC) as defined in SSPC SP 12 to thoroughly clean all designated surfaces. This involves the use of pressures less than 5,000 psi. Use steam cleaning in lieu of water washing only upon approval of the Engineer. Provide product data and MSD sheets for Engineer review

and approval for any proposed additives that will be used to remove grease, dirt, mildew or other surface matter.

Supplement the water or steam cleaning by wiping or scrubbing as needed to provide a surface, which when viewed without magnification, is free of all visible dirt, chlorides, oil, grease, mildew, chalk, bird droppings, or other foreign matter. Wipe a cloth of contrasting color across the surface at random. Unless otherwise directed by the Engineer, clean the surface until an ASTM D 659 chalk rating of 8 or better is obtained.

Unless specified otherwise in the Special Requirements, the water need not be collected, but use mesh tarpaulins with openings no greater than 25 mils in diameter to collect paint chips and debris. Remove the collected material once a day, or more frequently if directed by the Engineer, and store for proper disposal. Additional restrictions are imposed when pressure washing bridges that span a public water supply or sensitive streams (e.g., trout streams).

For structures spanning a public water supply or in the watershed area of the New York City water supply, divert, collect, and/or dispose of the water on the adjoining land mass. at a location away from the waters edge. Do not allow the spent water to enter the water supply.

Spent water free of paint chips and debris is allowed to enter sensitive streams at certain times of the year. Sensitive streams are susceptible to thermal shock and pollutants. Pressure wash these structures only when adequate flow in the stream exists to dilute possible contaminants. Verify the DEC categorization of the stream. For streams categorized as "CT(s)," conduct all washing prior to July 1, otherwise collect all water. For bridges located at DEC yearling trout stocking sites, do not conduct any washing during April.

#### SSPC SP 1 Solvent Cleaning

Remove all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants from the surface in accordance with SSPC SP 1.

Only use solvents or detergents that are acceptable to the coating manufacturer and the Engineer. Provide product data and MSD sheets on proposed solvents or detergents for Engineer approval.

#### SSPC SP 2 Hand Tool Cleaning

Use scrapers, putty knives, wire brushes, chipping hammers and other similar tools to thoroughly clean all surfaces specified in the Special Requirements. Comply with the requirements of SSPC SP 1 and SP 2 to remove all visible oil, grease, dirt, dust, loose mill scale, loose rust, loose paint, and other loose foreign matter.

It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale; rust, and paint are considered to be adherent if they cannot be removed by lifting with a dull putty knife.

SSPC VIS 3 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

#### SSPC SP 3 Power Tool Cleaning

Use power assisted hand tools such as sanding discs or 3M clean and strip discs, wire brushes, needle guns, or similar tools to thoroughly clean all surfaces specified in the Special Requirements. Comply with

the requirements of SSPC SP 1 and SP 3 to remove all visible oil, grease, dirt, dust, loose mill scale, loose rust, loose paint, and other loose foreign matter.

It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife.

SSPC VIS 3 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

#### SSPC SP 11 Power Tool Cleaning to Bare Metal

Use power assisted hand tools such as needle guns, Roto peening equipment, or similar tools to thoroughly clean all surfaces specified in the Special Requirements. Comply with the requirements of SSPC SP 1 and SP 11 to remove all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted.

Provide a minimum surface profile of 1 mil on all prepared surfaces. Comply with deeper profile requirements if specified by the Engineer or the coating manufacturer.

SSPC VIS 3 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

#### SSPC SP 6 Commercial Blast Cleaning

Thoroughly blast clean all surfaces specified in the Special Requirements. Comply with the requirements of SSPC SP 1 and SP 6 to remove all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.

Allow staining to remain on no more than 33 percent of each nine square inch increment of surface area. Acceptable staining is limited to light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied paint.

The Contractor should anticipate that the existing steel contains intact mill scale beneath the coating. Note that an SP 6 cleanliness requires the removal of all mill scale. When removing intact mill scale, the appearance after cleaning may approach SP 10, Near White, or SP 5, White Metal. NYCDOT is not responsible for additional compensation for the Near White or White Metal appearance that may result when removing the mill scale.

Unless restricted otherwise by the Engineer or the Special Requirements, accomplish the SP 6 degree of cleaning using any of the following: dry blast cleaning with recyclable or expendable abrasives, wet abrasive blast cleaning, water jetting with abrasive injection, or vacuum blast cleaning. If it is proposed that wet methods of preparation be used, provide a letter from the coating manufacturer which approves the use of the specific method for their coating system. Include written recommendations from the coating manufacturer regarding the type of inhibitor, if any, that should be used to prevent flash rusting of the steel. Allow the surface to thoroughly dry prior to painting, and apply the primer before any visible rusting occurs.

SSPC-VIS 1 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

#### SSPC SP 7 Brush off Blast Cleaning

Thoroughly blast clean all surfaces specified in the Special Requirements. Comply with the requirements of SSPC SP 1 and SP 7 to remove all visible oil, grease, dirt, dust, loose paint, loose rust, loose mill scale, and other foreign matter. Verify that the surfaces have been exposed to the abrasive and that the surfaces are densely and uniformly roughened.

It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. Verify that the edges of old, existing paint are feathered.

Unless restricted otherwise by the Engineer or the Special Requirements, accomplish the SP 7 degree of cleaning using any of the following: dry blast cleaning with recyclable or expendable abrasives, wet abrasive blast cleaning, water jetting with abrasive injection, or vacuum blast cleaning. If it is proposed that wet methods of preparation be used, provide a letter from the coating manufacturer which approves the use of the specific method for their coating system. Include written recommendations from the coating manufacturer regarding the type of inhibitor, if any, that should be used to prevent flash rusting of the steel. Allow the surface to thoroughly dry prior to painting, and apply the primer before any visible rusting occurs.

SSPC VIS 1 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

#### SSPC SP 10 Near White Blast Cleaning

Thoroughly blast clean all surfaces specified in the Special Requirements. Comply with the requirements of SSPC SP 1 and SP 10 to remove all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.

Allow staining to remain on no more than 5 percent of each nine square inch increment of surface area. Acceptable staining is limited to light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied paint.

Unless restricted otherwise by the Engineer or the Special Requirements, accomplish the SP 10 degree of cleaning using any of the following: dry blast cleaning with recyclable or expendable abrasives, wet abrasive blast cleaning, water jetting with abrasive injection, or vacuum blast cleaning. If it is proposed that wet methods of preparation be used, provide a letter from the coating manufacturer which approves the use of the specific method for their coating system. Include written recommendations from the coating manufacturer regarding the type of inhibitor, if any, that should be used to prevent flash rusting of the steel. Allow the surface to thoroughly dry prior to painting, and apply the primer before any visible rusting occurs.

SSPC-VIS 1 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

### SSPC-SP 5 White Metal Blast Cleaning

Thoroughly blast clean all surfaces specified in the Special Requirements. Comply with the requirements of SSPC-SP 1 and SP 5 to remove all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter.

Unless restricted otherwise by the Engineer or the Special Requirements, accomplish the SP 5 degree of cleaning using any of the following: dry blast cleaning with recyclable or expendable abrasives, wet abrasive blast cleaning, water jetting with abrasive injection, or vacuum blast cleaning. If it is proposed that wet methods of preparation be used, provide a letter from the coating manufacturer which approves the use of the specific method for their coating system. Include written recommendations from the coating manufacturer regarding the type of inhibitor, if any, that should be used to prevent flash rusting of the steel. Allow the surface to thoroughly dry prior to painting, and apply the primer before any visible rusting occurs.

SSPC-VIS 1 and the approved surface preparation test section may be used as an aid in determining the quality of cleaning. In the case of conflict between the written definitions and the visual standards or test sections, the written definitions prevail.

#### Surface Cleaning Requirements Bare Galvanized Surfaces Other than Cables

Remove lubricant or residuals from galvanized surfaces by solvent cleaning in accordance with SSPC-SP 1.

If the carbon steel is being prepared by abrasive blast cleaning, provide a uniform and dense anchor pattern across the entire surface of the galvanized in accordance with the requirements of SSPC SP 7, Brush Off Blast. Control the blast cleaning to minimize the amount of galvanizing that is removed.

If blast cleaning is not being employed on the project, clean and roughen the entire surface using power tools in accordance with SSPC SP 3.

#### Feathering

In all areas where existing coating is allowed to remain, feather the transition between the existing coating and adjacent bare steel. Feather for a distance of 1 to 2 inches to provide a smooth, tapered transition into the existing intact coating.

Verify that the edges of the existing coating are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP 3. Roughen the existing coating in the feathered area to assure proper adhesion of the newly applied coats.

#### Abrasive Cleanliness

When abrasive blast cleaning is specified, verify the cleanliness of the abrasive.

For disposable abrasives, select a new, unused sample and conduct the water soluble contaminant and oil content tests outlined in SSPC-AB 1 at least one time each week. If the results do not comply with the SSPC criteria, stop using the abrasive and immediately notify the Engineer.

For recyclable abrasives, select a sample from each recycling machine in use and conduct the non abrasive residue, water soluble contaminant, and oil content tests outlined in SSPC AB2 at least one time each week. Conduct the lead content tests at least one time each month on a sample from each machine. If the results do not comply with the SSPC criteria, notify the Engineer immediately, and remove and replace the abrasive and clean the recycling equipment. Conduct additional tests each day to confirm that the equipment is functioning properly. Return to the weekly testing intervals as directed by the Engineer.

Record the results of all abrasive tests in a log book or report form that is maintained at the jobsite. Make the results available for review by the Engineer at any time.

### Surface Profile

When abrasive blast cleaning to SP 6, SP 10, or SP 5 is specified, provide a surface profile of 1.5 to 3.5 mils unless the requirements of the coating manufacturer differ and are approved by the Engineer in writing. Measure the surface profile using the Keane Tator Surface Profile Comparator or Testex Replica Tape in accordance with ASTM D4417.

When SSPC SP 11 is specified, provide a minimum surface profile of 1.0 mil, or a profile of a greater minimum depth if required by the coating manufacturer or the Engineer. Comply with any maximum profile limitations established by the coating manufacturer. Measure the surface profile using the Testex Replica Tape in accordance with ASTM D4417.

### Chloride Remediation

Verify that chloride is remediated to a level of no greater than  $\mu 7g/cm^2$ . Use the swabbing or cell methods of SSPC TU 4 to collect the samples and analyze by Kitigawa tube or Quantab strip. When total coating removal is specified, conduct the tests in previously rusted areas. When overcoating is specified, conduct the tests in both previously rusted areas and on intact coating.

Conduct a minimum of 5 tests per span or as otherwise directed by the Engineer. Conduct the tests upon completion of surface preparation and prior to paint application. If unacceptable levels of soluble salt remain, reclean the affected areas until acceptable results are achieved.

Methods of chloride removal may include, but are not limited to, steam cleaning or pressure washing and scrubbing before or after initial paint removal, abrasive blast cleaning the steel and allowing it to rust overnight followed by reblasting, blast cleaning with blends of fine and course abrasives, or wet abrasive blast cleaning. Describe the proposed method(s) of chloride remediation in the submitted Surface Preparation/Painting Plan.

## PAINT STORAGE, MIXING, AND HANDLING

### Paint Storage

Store all flammable materials in approved storage containers at locations approved by the Engineer. Do not locate storage containers closer than 50 feet from any facility unless approved by the Engineer.

Store all paint, thinners, and solvents in accordance with OSHA and Fire Department regulations and the requirements of the paint manufacturer. Store the paint and solvents under cover, out of direct sunlight and protected from vandalism.

Maintain the storage temperature between 40°F and 90°F. If the requirements of the manufacturer are more restrictive, comply with the more restrictive requirements.

Provide the size and number of fire extinguishers in proper proportion to the quantity of paint stored.

Use explosion proof lighting fixtures in the storage area.

Do not permit smoking in paint storage, mixing, and application areas.

Keep all containers of paint unopened until required for use.

Replace all damaged or leaking containers of paint at no cost to the NYCDOT.

Do not open or mix paints in the storage area.

Do not return mixed paints to the storage area.

Use Underwriter's Laboratories approved containers for transporting paint to mixing areas.

Do not permit the accumulation of empty paint cans, combustibles, and other debris.

Maintain MSDS for all materials.

#### Mixing and Thinning of Coating Materials

Verify that the paint to be mixed has not exceeded its shelf life. Remove from the project site, all paint with an expired shelf life.

When required by the manufacturer, warm paints stored at less than 50°F to above 50°F prior to mixing.

Utilize proper ventilation in the mixing area to prevent injury to workmen or the accumulation of volatile gases.

Mix all coatings in accordance with the requirements of the coating manufacturer. Use mechanical equipment such as a Jiffy mixer when allowed by the manufacturer.

Unless approved by the Engineer, mix only complete kits of multi-component materials. Mixing of partial kits is not allowed.

Do not use two component materials beyond the pot life established by the manufacturer's written instructions.

Do not thin any paints unless approved in writing by the paint manufacturer and the Engineer. If thinning is required and authorized, use only those types, brands, and amounts of clean thinner stipulated by the coating manufacturer. Carefully measure the amount of thinner added and thin only in the presence of the Engineer.

Strain materials after mixing to remove agglomerations.

## COATING APPLICATION

Painting Plans - Apply all coatings in accordance with the requirements of this Section, the coating manufacturer's instructions, and the approved Surface Preparation/Painting Plan provided under "Submittals."

Limited Access Areas - Provide "best effort" coating application in areas specifically defined in paragraph 3.08 H or by the Engineer as presenting limited accessibility for thorough paint application. The definition of limited access and acceptance of the reduced quality of application is left to the sole discretion of the Engineer.

### Quality of Surface Preparation Prior to Painting

Verify that the surface exhibits the specified degree of chloride remediation, washing, hand tool, power tool, or abrasive blast cleaning immediately prior to painting.

Apply the first coat before rusting or degradation of the surface occurs, but in no case allow the prepared surface to stand 12 hours prior to painting. Reclean rusted or degraded surfaces, or those surfaces that have stood over 12 hours prior to painting.

### Surface Cleanliness Prior to Painting and Between Coats

When overcoating existing paint, or finish coating shop primer, verify that the coatings have been thoroughly cleaned prior to painting, and that pockets are dry and free of mud, dirt, and other accumulations. In the case of shop coats, verify that the manufacturer's maximum recoat times have not been exceeded.

Thoroughly clean the surface of each coat prior to the application of the next to remove spent abrasive, dirt, dust, cement spatter, and other interference material. Comply with the requirements of NYCDOT Section 832, Specification for Lead Paint Removal Worker/Environmental Protection and Waste Handling for the special restrictions on using compressed air for cleaning when removing paints which contain lead or other toxic metals.

If grease or oil have become deposited on the bare steel or on the surface of any of the applied coats, remove by solvent cleaning in accordance with SSPC SP 1 prior to the application of the next coat.

Ambient Conditions During Coating Application Apply coatings under the following conditions. Do not apply coatings under conditions outside of the ranges specified below without written approval of the coating manufacturer, and specific written authorization from the Engineer.

Surface and Air Temperatures See attached Paint System Tables.

Relative Humidity See attached Paint System Tables.

Dew Point See attached Paint System Tables.

Frost/Rain Do not apply coatings to surfaces containing frost or free standing water, or during rain, fog, or similar detrimental weather conditions.

Remove and replace any paint that is exposed to unacceptable conditions (e.g. rain or dew) prior to adequate curing.

Methods of Application - Unless specified otherwise in the Special Requirements, or restricted by the coating manufacturer, apply the coatings by the methods shown below. Prior approval from the Engineer is required before spray application is permitted. In order to obtain approval, provide the Engineer with the methods of containment that will be employed and the special precautions that will be taken to control overspray.

Brush application - Use round or oval brushes. Use flat brushes only on large plate surfaces between connections, and only upon approval of the Engineer. Brush apply the paint using a series of small circles to thoroughly fill in all surface irregularities, and end with a series of parallel strokes to smooth the finish.

Roller application - Only use rollers on large plate surfaces between connections, and only upon approval of the Engineer. Select a nap size and roller quality that will properly wet the substrate and produce a smooth, uniform film. Apply the coating in a such a manner as to achieve complete and thorough coverage of the surface and all irregularities. Back roll the surface after application to create a smooth, uniform finish.

Daubers - On metal surfaces which are inaccessible for paint brushes, use sheepskins or daubers especially constructed for the purpose.

Airless or conventional spray application - If conventional spray is approved for use, verify that the compressed air supply is clean and dry as determined by the blotter test in accordance with ASTM D4285. When spraying, use extreme care to avoid contamination of surrounding areas, and strictly follow the containment methods and practices that were approved by the Engineer.

Material Agitation - Unless prohibited by the manufacturer or when using moisture curing urethanes, keep all paint materials under agitation during application. When using brush, roller, or dauber application, periodically stir the material during use to keep it agitated.

### Recoat Times

Apply each coat only after the previous coat has been allowed to dry as required by the manufacturer's written instructions, but as soon as possible to minimize the length of time that the coating is exposed to dust and other contamination. Do not allow any coat to remain exposed for longer than the recoat times provided in the attached Paint System Tables.

In the case of shop primer that is overcoated in the field, verify that the recoat window has not been exceeded before overcoating.

Remove and replace all coats if the applied coat exceeds the maximum recoat time prior to overcoating, if the shop applied coat exceeds the manufacturer's maximum recoat times, or a coat is exposed over the winter months prior to the application of the next.

### Coverage, Continuity, and Stripe Coating

Apply each coat in a workmanlike manner to assure thorough wetting of the substrate or underlying coat, and to achieve a smooth, streamline surface relatively free of dryspray, overspray, and orange peel.

Shadow through, pinholes, bubbles, skips, misses, lap marks between applications, or other visible discontinuities in any coat are unacceptable. Runs or sags may be brushed out while the material remains wet.

When applying penetrating sealer (Paint Systems B', C', and D'), apply the sealer in such a manner that it thoroughly wets the underlying coat or substrate, and wicks into crevices and under the edges of old paint (when used for overcoating). When flowing the sealer into these areas, remove excess material while it remains wet. Do not exceed the maximum dry film thickness for the product as defined in the Paint System tables.

Remove dryspray and overspray by sanding or screening prior to the application of the next coat. When present on the finish, remove as directed by the Engineer and apply another coat of finish to the area. Remove all other defective coating to sound material and reapply.

Thoroughly coat all surfaces with special attention to hard to reach areas, and irregular surfaces such as lacing bars and rivets. When coating configurations such as bolts, apply the material from multiple directions to assure complete coverage.

Unless stipulated otherwise in the Special Requirements, apply a stripe coat to all edges, welds, crevices, rivets, bolt threads, bolt heads, and other surface irregularities.

With the exception of Systems B, B', C, and C' (systems that utilize organic zinc primers), use the intermediate coat for the stripe coat. Apply the stripe coat of intermediate prior to the application of the full intermediate coat. The intermediate coat can be applied while the stripe coat is still tacky. Note that for those systems that utilize a penetrating sealer, the sealer is not considered to be the intermediate coat for the purpose of striping.

For Systems B, B', C, and C', use the organic zinc primer as the stripe coat. Apply the stripe coat either before or after the application of the full coat of primer. When applying the stripe coat before the full prime coat, the full coat can be applied while the stripe coat is still tacky. When applying the stripe coat after the full prime coat, do not apply the stripe coat until the full prime coat has cured sufficiently to withstand foot traffic. Do not apply the next coat until the stripe coat has cured for the recoat times shown in the Paint System Tables.

Apply the stripe coat by brush (except for inorganic zinc) or spray to ensure complete and thorough coverage. The purpose is to increase the film build on projecting surfaces such as edges, and to assure that the coating is thoroughly worked into, and completely covers all irregular surfaces such as crevices. When brushing organic zinc primers, repeatedly stir the material with the brush during use to prevent settling of the zinc. Extend the stripe coat approximately 1" from edges.

Wet Film Thickness - Use wet film thickness gages in accordance with ASTM D4414 to monitor the thickness of each coat at the time of application.

#### Dry Film Thickness and Corrective Action for Thickness Deviations

Unless directed otherwise by the Engineer, apply each coat to the thicknesses specified in the attached Paint System Tables.

Measure the thickness of each coat using nondestructive magnetic dry film thickness gages. Comply with SSPC PA2 for the calibration and use of the gages, and the frequency of thickness measurements. Spot

readings both 20% above and 20% below the specified thicknesses are permitted, provided the average thicknesses are within the specified tolerances.

Measure the thickness of each coat applied to non ferrous metal substrates using nondestructive thickness gages in accordance with ASTM D1400.

If there are questions regarding the non destructive measurements of coating thickness, a Tooke Gage (destructive scratch gage) may be used when authorized by the NYCDOT. Conduct measurements in accordance with ASTM D4138, but limit the use of the gage to a minimum of locations. Mark and repair all damage caused by the destructive testing, whether created by the Engineer or the Contractor. Repair the damage from testing at no cost to the NYCDOT.

Apply additional coating of the same type to areas of insufficient thickness. Use care during application to assure that all repairs blend in with the surrounding material.

Unless directed otherwise by the Engineer in writing, remove excessive coating thickness and reapply the affected coat(s).

#### Coating Adhesion

Apply all coats in such a manner to assure that they are well adherent to each other and to the substrate. If the application of any coat causes lifting of an underlying coat, or there is poor adhesion between coats or to the substrate, remove the coating in the affected area to adjacent sound, adherent, coating, and reapply the material.

If adhesion is suspect, conduct adhesion tests in accordance with ASTM D3359 or ASTM D4541 as directed by the Engineer, and repair all test areas. The acceptance criteria for the testing will be established by the Engineer and the coating manufacturer. Replace all defective coating that is revealed by the testing.

#### Caulking

When specified in the Special Requirements, use caulking to seal crevices and areas of pack rust that can not be removed.

Identify the caulking materials to be used in the pre project submittals. Use only caulking materials that are acceptable to the paint manufacturer and the Engineer.

Unless directed otherwise by the Engineer, apply caulking after the application of the coating system. Use a caulking that matches the color of the finish coat.

Mix and install the caulking in strict accordance with the approved Surface Preparation/Painting Plan and the caulking manufacturer's instructions.

### REPAIR OF DAMAGE AND UNACCEPTABLE COATINGS

#### Surface Preparation of Localized Areas

The Engineer will define the areas of damage, corrosion, or unacceptable coatings that are considered to be localized for the purposes of repair. Repair these areas at no additional cost to the NYCDOT.

Prepare the surface by solvent cleaning in accordance with SSPC-SP 1 prior to mechanical cleaning.

In areas previously blast cleaned, if the damage exposes the substrate, remove all loose material and prepare the steel in accordance with SSPC SP 11. Follow with solvent cleaning in accordance with SSPC-SP 1 to remove surface contamination.

In areas originally prepared by power tool cleaning, or if the substrate is not exposed in those areas previously blast cleaned, remove all loose material and prepare the surface in accordance with SSPC-SP 3. Use SSPC-SP 2 hand tool cleaning for surface preparation only upon written approval of the Engineer. Follow with solvent cleaning in accordance with SSPC-SP 1 to remove surface contamination.

#### Surface Preparation of Extensive Areas of Damage or Unacceptable Coating

The Engineer will define the areas of damage, corrosion, or unacceptable coatings that are considered to be extensive for the purposes of repair. Repair these areas at no additional cost to the NYCDOT.

Remove all coatings in accordance with the originally specified degree of surface preparation.

When abrasive blast cleaning is employed, use extreme care to avoid damage to the surrounding coating due to overblast.

#### Feathering of Repair Areas

Feather the existing coating surrounding each repair location. Feather for a distance of 1 to 2 inches to provide a smooth, tapered transition into the existing intact coating.

Verify that the edges of coating around the periphery of the repair areas is tight and intact by probing with a putty knife in accordance with the requirements of SSPC SP 3. Roughen the existing coating in the feathered area to assure proper adhesion of the repair coats.

#### Coating Application in Repair Areas

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

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

Maintain the thickness of the system in overlap areas within the specified total thickness tolerances.

#### HOUSEKEEPING AND WASTE DISPOSAL

Conduct housekeeping daily to maintain the work site in a neat and orderly condition.

Unless directed otherwise by the Engineer, at the end of each day at a minimum, haul empty paint cans and other debris to the waste storage area.

Remove all paint drips, splashes, and overspray from surfaces not intended to be painted.

Upon project completion, remove all equipment and materials, correct any damage caused by the operation, and leave all surfaces in a clean and acceptable condition. Correct any damage created and conduct all necessary project clean up at no additional cost to NYCDOT.

Handle, store, transport, and dispose of all hazardous and non hazardous project waste in strict accordance with Federal and state regulations.

### INSPECTION

The NYCDOT will inspect all phases of the Work to verify that it is in accordance with the requirements of this Section.

Facilitate this inspection as required, including allowing ample time for the inspections and providing suitable lighting (50 foot candles minimum at the surface), access to the work, and all necessary safety and fall protection equipment.

Inspections will include the following minimum hold points to determine specification compliance. Do not proceed with subsequent phases of the Work until the preceding phase has been approved by the Engineer: prior to the start of surface preparation work, immediately following surface preparation, immediately prior to the application of the first coat, prior the application of each additional coat, and after the final coat is applied and dried.

The presence or activity of NYCDOT inspections in no way relieves the Contractor of the responsibility to comply with all requirements of this Section, and to provide adequate quality control inspections of its own to assure compliance with the approved Surface Preparation/Painting Plan. Report the results of daily Contractor quality control inspections in a log book or report that is maintained at the jobsite. Make the report available to the Engineer for review upon request.

Furnish, until final acceptance of the coating system, all equipment and instrumentation needed to inspect all phases of the work. The equipment is identified in Part 2.0, Products.

### ONE YEAR ANNIVERSARY INSPECTION

A one year anniversary inspection will be conducted approximately twelve months after completion of the painting. Participate in this inspection with the Engineer. Arrange for a representative of the coating manufacturer to be present for this inspection.

For projects where total coating removal and replacement were performed, repair, at no cost to the NYCDOT, all locations where the coating exhibits disbonding, cracking, rusting, or other such defects.

For projects where coating repair and overcoating were performed:

Repair, at no cost to the NYCDOT, all locations where the coating exhibits disbonding, cracking, rusting, or other such defects in those areas where the new system was applied to bare substrate.

Repair, at no cost to the NYCDOT, all areas where the new coats are not adhering to each other at any location across the structure.

The contractor is not responsible for the lifting of the old coating material provided the work was performed in compliance with this Section. Where the work is not in compliance with the requirements of this Section (e.g., excessive dry film thickness), repair the lifting old coating.

Perform all repairs in accordance with the requirements of this Section, the coating manufacturer's written instructions, and written repair procedures approved by the Engineer.

**METHOD OF MEASUREMENT.**

Lump Sum for each item. Include in the price bid, the costs for all labor, tools, equipment, paints, materials, scaffolding, supplies, plans, programs, services of the manufacturer's representative, traffic controls, or incidentals to properly perform and complete the Work specified in this Item.

Caulking Per lineal foot. Include in the price bid, the costs for all labor, tools, equipment, materials and incidentals needed to properly perform the Work specified in this Item.

**BASIS OF PAYMENT.** Partial payments will be made. The contract lump sum price will be prorated to establish the amount of each partial payment based on the percentage of the structure that has been painted. Within each area, payments will be made as follows: 50% after satisfactory preparation and priming, 20% after satisfactory application of intermediate, and 30% after satisfactory application of finish.

## APPENDIX A – SUBMITTALS

### GENERAL

This Appendix identifies the plans, programs, and documentation required prior to mobilization on site, at the start of construction, and during the construction phase.

### PRE CONSTRUCTION SUBMITTALS

#### Submittal Schedule and Engineer Acceptance

Submit the following plans and programs to the Engineer for review and acceptance a minimum of 20 days prior to mobilization to the project site. The Contractor shall not begin any paint removal Work until the Engineer has accepted the submittals.

Do 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 City 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.

Project Schedule - Provide the Engineer with an initial estimate of the workdays required to complete each phase of the project (e.g., mobilization, paint removal, paint application, and demobilization).

Certifications - Unless the requirement for SSPC QP1 and QP2 certification is eliminated by the Special Requirements, provide evidence of current certification.

#### Contractor Chain of Command

Submit a listing of key Contractor personnel, including names and relative positions, addresses, and telephone and pager numbers.

Include the names and telephone/pager numbers for contact persons who are available on a 24 hour basis in the event of emergencies.

Worker Safety Plan - Develop and implement a worker safety plan for the protection of all job site workers in accordance with NYSDOT Section 107-05 and all associated Special Notes (e.g., Fall Protection Requirements). Include provisions for the inspection and removal of pigeon droppings in accordance with NYSDOT Safety Bulletin SB 94 4.

Containment and Scaffolding - If the bridge supports the containment or scaffolding system, provide containment drawings, calculations, and assumptions, including ventilation criteria as appropriate, signed and sealed by a Professional Engineer.

#### Surface Preparation/Painting Plan

Provide written procedures for conducting the Work of this Section including, but not limited to the following as applicable: the preparation of surfaces; abrasive cleanliness tests; the remediation of chloride and ferrous salts; coating mixing, application, and repair; recoat times and cleaning between coats; and the installation of caulking and sealant materials. Provide specific details for the preparation and painting of limited access areas, and for striping edges, corners, crevices, rivets, bolts, welds and sharp edges. If shop applied primer is finish coated as a part of the Work, include the procedures that will be followed for the cleaning of the primer prior to field painting.

Provide a comprehensive listing of the equipment that will be used for surface preparation and painting. Include a description of equipment repair and replacement capability, including the procedures that will be followed in the event of equipment failure so that lost production time is kept to a minimum.

Identify the methods of protection or work isolation procedures that will be followed to protect surrounding structures, equipment, and property from exposure to surface preparation and paint debris.

If it is proposed that the coatings be applied by spray, provide the containment methods proposed for use together with any additional precautions that will be taken to control overspray. Spray application can not be used unless approved by the Engineer.

Provide the name and chemical composition, product data sheets, and MSD sheets of detergents or solutions that will be used for cleaning the existing coating or for the removal of mildew. Only use detergents which are environmentally safe and which will have no adverse effect on aquatic life are acceptable.

If abrasive blast cleaning is specified, identify the type and brand name of the abrasive proposed for use, and provide MSD sheets or other documentation from the supplier which identifies the hazardous materials that are present and confirms that the abrasive contains less than 1% free silica.

If the coating manufacturer recommends a different surface profile for their product than 1.5 to 3.5 mils, provide a letter from the manufacturer stating the recommended surface profile range. Comply with the manufacturer's recommended profile only upon written approval of the Engineer.

If wet abrasive blast cleaning is proposed, include a letter from the coating manufacturer which approves the use of the method for their coating and recommends inhibitor(s), if any, that can be used to prevent flash rusting, together with a statement that the inhibitor(s) will not reduce coating performance. Submit application procedures and MSD sheets for the inhibitor that will be used. Use an inhibitor only upon approval of the Engineer.

#### Quality Control Plan

Provide written procedures for conducting the quality control inspections of work quality identified in this Section including, but not limited to the following as applicable: the preparation of surfaces; abrasive cleanliness tests; the remediation of chloride and ferrous salts; coating mixing, application, and repair; recoat times and cleaning between coats; and the installation of caulking and sealant materials. If shop applied primer is finish coated as a part of the Work, include the procedures that will be followed for the inspection of the cleaning of the primer prior to field painting.

Provide a comprehensive listing of the inspection equipment that will be used for surface preparation and painting, and the means that will be used to verify that it is properly calibrated during use.

Provide samples of the forms that will be completed to document the results of the inspections.

Provide proof of the training and experience of the inspectors who will be conducting the quality control inspections.

#### Coating/Caulking Material Documentation

Identify the coating materials to be applied, including all thinners proposed for use. Include the manufacturer's name, product names, and product numbers. Provide material product data sheets, VOC levels, MSD sheets, and written application instructions including mixing requirements, specified thinners, and thinner amounts. Requests to use reagent grade generic thinners must be provided to the Engineer in writing, together with a letter from the coating manufacturer which supports the use of the generic thinner. Do not use a generic thinner without written approval from the Engineer.

Provide the manufacturer's color designation for the color of the finish coat to be used. Submit a sample of the finish colors) to the Engineer for approval prior to application.

Provide a written certification from the manufacturer with each batch of material supplied to the jobsite, stating that the batch meets the manufacturer's product specifications.

When the use of caulking is specified in the Special Requirements, provide the name, generic type, and MSDS for the proposed material. The caulking must be approved by the coating manufacturer. Include a letter from the coating manufacturer acknowledging acceptance of the caulking for use with the coating system.

In the event of a conflict between the manufacturer's technical data and the requirements of this Section, advise the Engineer of the discrepancies in writing, and comply with the Engineer's written resolution.

#### Sensitive Natural Resources and Endangered or Protected Species

If the project is located in a natural resource area, develop a site specific Habitat Protection Plan addressing the steps that will be taken to protect these sensitive ecological areas from damage.

If peregrine falcons, barn owls or red tailed hawks are found to be nesting on the bridge, either before the work begins, or once the work is underway, develop a site specific plan for the sequencing of paint

removal operations to avoid disturbing nesting pairs. Include provisions for obtaining the required Federal USF&WS and NYSDEC permits if it is proposed that unoccupied peregrine falcon nests be moved.

Noise Permits If work will be performed outside of the hours of 7AM to 6PM on weekdays, obtain a permit authorizing these activities, and provide the Engineer with a copy.

## CONSTRUCTION START UP SUBMITTALS

### Surface Preparation Test Sections

Prior to proceeding with production surface preparation operations, provide a written summary of the results of the surface preparation evaluation. Identify the specific test locations, the equipment used, the quality of cleaning achieved, and whether the test areas were preserved for future reference.

Only use equipment that is approved by the Engineer on the basis of successful use on the test sections.

## CONSTRUCTION PHASE SUBMITTALS

### Material Manufacturer's Site Reports

Submit to the Engineer, a copy of the field summary reports prepared by the coating manufacturers) upon completion of each site visit.

Provide each report within 1 week after the visit.

Material Manufacturer's Batch Certifications - Provide a letter from the material manufacturer with each batch to indicate that the material meets the manufacturer's written product specification.

Abrasive Cleanliness Test Reports - When abrasive blast cleaning is specified, record the results of the weekly abrasive cleanliness tests (monthly test in the case of lead content of recyclable abrasives) in a log book or report form that is maintained at the jobsite. Make the results available for review by the Engineer at any time. Notify the Engineer immediately of unacceptable results.

Inspection Log - Maintain a daily inspection log or report which itemizes the results of all quality inspections conducted by the Contractor. Make the reports available for review by the Engineer upon request.

APPENDIX B – HISTOPLASMOSIS  
(Code: SB 94 4, Date: 1/21/94)

INTRODUCTION

Employees engaged in a variety of tasks are often required to work in areas where pigeons have nested, usually for long periods. Such conditions are often found in bridge structures and cold storage facilities. This nesting results in a substantial build up of pigeon droppings, a condition which can be harmful to humans if the material is disturbed and made airborne.

Histoplasmosis is a fungal infection resulting from exposure to pigeon droppings. Infectious material enters the body usually by inhalation into the lungs, but in some cases by ingestion through the mouth into the gastrointestinal tract. Pigeons do not carry the organism that causes histoplasmosis. Histoplasmosis is caused by a soil organism that requires the moist, nutrient rich environment that large masses of droppings offer. Areas with small amounts of dried droppings pose minimal hazard.

This Safety Bulletin is intended to alert employees of this potential health hazard and establish common sense precautions to minimize exposure.

PROCEDURES

Prior to work in any area where pigeons nest, a thorough inspection should be made to determine if, and to what extent there is a build up of material. Inspection itself requires minimum precautions such as the use of personal protective equipment, which may include gloves, rubber boots, rain suit components, goggles and a dust/nuisance respirator. Questions regarding proper equipment for this activity should be directed to the Regional Safety Representative or Employee Safety & Health Section.

If substantial material is found in the immediate work area, cleaning must be performed. Employees engaged in cleaning activity shall wear all of the personal protective equipment specified above. A high powered water hose is an effective means to remove material. If the material is to be scraped away, it must be kept wet during the entire process. Application of a cleaning agent (bleach, for example), before removal may help dissolve the material, and may be applied as a disinfectant upon the affected surfaces after the droppings have been removed. Compressed air shall not be used to remove pigeon droppings because it increases the potential for inhalation and ingestion of airborne particles and the area of potential exposure.

When cleaning has been successfully completed, the personal protective equipment specified above is no longer required. All other personal protective equipment appropriate for the task and/or location shall be used, such as fall protection, hard hat, etc.

Employees engaged in cleaning, or any other activity which involves exposure to pigeon droppings, should observe a high degree of personal hygiene, even if the exposure is casual. Special care must be taken to wash hands thoroughly before eating or smoking.

## APPENDIX C – PAINT SYSTEM TABLES

### Paint System A

Inorganic Zinc Rich / Epoxy / Urethane (all coats shop applied)

### Paint System A'

Inorganic Zinc Rich / Epoxy / Urethane (primer shop applied; finish coats field applied)

### Paint System B

Epoxy Zinc Rich / Epoxy / Urethane

### Paint System B'

Epoxy Zinc Rich / Epoxy / Urethane (penetrating sealer applied after primer)

### Paint System C

MCU Zinc / MCU intermediate / MCU finish

### Paint System C'

MCU Zinc / MCU intermediate / MCU finish (sealer applied after primer)

### Paint System D

MCU Aluminum / MCU intermediate / MCU finish

### Paint System D'

MCU Alum / MCU intermediate / MCU finish (sealer applied before or after primer)

### Paint System E

Alkyd / Alkyd / Silicone Alkyd

### Paint System F

Alkyd / Alkyd / Aluminum Alkyd

### Paint System G

Aluminum Epoxy Mastic/ Epoxy / Urethane

PAINT SYSTEM A and A'  
INORGANIC ZINC RICH / EPOXY / ACRYLIC ALIPHATIC URETHANE

DESCRIPTION

This system is used for the shop painting of new steel. For System A, all coats are applied in the shop followed by touch up in the field. For System A', the primer is applied in the shop followed by the application of the intermediate and finish coats in the field.

PAINT SYSTEM REQUIREMENTS

VOC compliant system (<450 grams/liter or 3.8 pounds/gallon). Inorganic zinc primer in compliance with SSPC Paint 20 with a minimum 80% zinc content in the dry film. High build epoxy polyamide intermediate. Aliphatic acrylic urethane finish with total isocyanate group content (by percentage, pigment free basis) shall be 2%. All coatings shall be lead and chromate free.

SURFACE PREPARATION

Prepare the surfaces to an SSPC-SP 10, Near White Blast Cleaning, unless stipulated otherwise in the Special Requirements. When all coats are applied in the shop (System A), mask faying and contact surfaces to prevent the application of the intermediate and finish coats to these areas (only apply the zinc primer). When the primer is applied in the shop followed by field topcoats (System A'), take special care to thoroughly clean the primer of all dirt, debris, grease, and oil in accordance with SSPC SPI, Solvent Cleaning prior to applying the field coats.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature 40°F to 100°F

Dew Point Surface temperature should be at least 5°F above the dew point

Relative Humidity 40% to 90%

COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Coating manufacturer addresses and contact numbers are provided after the last Paint System Table. Dry film thickness for this System should be as follows (if the selected manufacturer recommends a different thickness range, provide the recommendation to the Engineer in writing for resolution):

Primer: 3 4 mils

Intermediate: 3 5 mils

Finish: 2 3 mils

## RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75°F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 24 hours minimum, 30 days maximum (may verify cure by solvent rub test with ASTM D4254)

Intermediate - 8 hours minimum, 30 days maximum

Finish - 8 hours minimum, 30 days maximum (additional coats or repairs beyond this time will require abrading by sanding or other means prior to coating application)

PAINT SYSTEM A and A'\*

INORGANIC ZINC RICH / EPOXY / ALIPHATIC URETHANE

<u>Manufacturer</u>	<u>Coat</u>	<u>Product</u>
Ameron Intermediate	Prime	Dimetcote 21 9
	Amercote 385	
	Finish	Amercoat 450 HS
Carboline	Prime	Carbo Zinc 11
	Intermediate	893
	Finish	134 HS
ICI Devoe Coatings	Prime	Cathacoat 304 V
	Intermediate	Devran 224 HS
	Finish	Devthane 359
International	Prime	Interzinc 22 HS
	Intermediate	Interseal 670 HS
	Finish	Interthane 990 HS
Sherwin Williams	Prime	Zinc Clad II
	Intermediate	Macropoxy 646
	Finish	High Solids Polyurethane

\*System A involves the application of all coats in the shop. System A' involves the application of the primer in the shop and the intermediate and finish coats in the field.

PAINT SYSTEM B and B'  
EPOXY ZINC RICH / EPOXY / ACRYLIC ALIPHATIC URETHANE

DESCRIPTION

This system is used for steel that is completely blast cleaned with all coats applied in the field. System B involves the use of a three coat epoxy zinc/epoxy/urethane system. System B' utilizes the same three coat system, except that a coat of penetrating sealer is applied to crevices and limited access areas between the prime and intermediate coats.

PAINT SYSTEM REQUIREMENTS

VOC-compliant system (<450 grams/liter or 3.8 pounds/gallon). Organic zinc primer in compliance with SSPC Paint 20 (Type II) with a minimum 80% zinc content in the dry film. High build epoxy polyamide intermediate. Aliphatic acrylic urethane finish with total isocyanate group content (by percentage, pigment free basis) shall be 2%. For System B', a coat of sealer is used between the prime and intermediate coats. The sealer shall be a high solids, low viscosity epoxy material. All coatings shall be lead and chromate free.

SURFACE PREPARATION

Prepare the surfaces to an SSPC-SP 10, Near White Blast Cleaning, unless stipulated otherwise in the Special Requirements.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature 40°F to 100°F

Dew Point Surface temperature should be at least 5°F above the dew point

Relative Humidity 10% to 85%

COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Coating manufacturer addresses and contact numbers are provided after the last Paint System Table. Dry film thickness for this System should be as follows (if the selected manufacturer recommends a different thickness range, provide the recommendation to the Engineer in writing for resolution):

Primer: 3.5 mils

Sealer\* 1.2 mils

Intermediate: 3.5 mils

Finish: 2.3 mils

\*Sealer used for System B' only.

### RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75°F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 24 hours minimum, 30 days maximum

Sealer\* - 24 hours minimum, 30 days maximum

Intermediate - 8 hours minimum, 30 days maximum

Finish - 8 hours minimum, 30 days maximum (additional coats or repairs beyond this time will require abrading by sanding or other means prior to coating application)

\*Sealer used for System B' only.

PAINT SYSTEM B and B'  
EPOXY ZINC RICH / EPOXY / ALIPHATIC URETHANE

Manufacturer	Coat	Product
Ameron	Prime (3 pak)	68 HS
	Sealer	Amerlock Sealer
	Intermediate	Amerlock 400
	Finish	Amercoat 450 HS
Carboline	Prime (3 pak)	858
	Sealer	Rustbond SG
	Intermediate	893
	inish	34 HS
ICI Devoe Coatings	Prime (2 pak)	Cathacoat 313
	Sealer	Pre-Prime 167
	Intermediate	Devran 224 HS
	Finish	Devthane 359
MAB	Prime (3 pak)	Ply-Tile 520 Zinc
	Sealer	Ply-Tile Rust Seal
	Intermediate	Ply-Tile 520
	Finish	Ply-Thane 890HS
Sherwin Williams	Prime (2 pak)	Zinc-Clad IV
	Sealer	Macropoxy 920
	Intermediate	Macropoxy 646
	Finish	Acrolon 218 HS

\*Sealer used for System B' only.

PAINT SYSTEM C and C'  
MOISTURE CURE URETHANE (MCU) ZINC /  
MCU INTERMEDIATE / MCU FINISH

DESCRIPTION

This system is used for the repainting of existing steel prepared by abrasive blast cleaning. System C involves the use of a three coat moisture cure urethane system, with zinc incorporated into the primer. System C' utilizes the same three coat system, except that a coat of penetrating sealer is applied to crevices and limited access areas between the prime and intermediate coats.

PAINT SYSTEM REQUIREMENTS

VOC compliant system(<335 grams/liter or 2.8 pounds/gallon). Moisture cure urethane (MCU) zinc primer in compliance with SSPC Paint 20 with a minimum 80% zinc content in the dry film. MCU intermediate with MCU aliphatic acrylic urethane finish. For System C', an MCU sealer coat is used between the prime and intermediate coats. The sealer material shall be a high solids, low viscosity urethane material. Total isocyanate group content (by percentage, pigment free basis) shall be as follows: primer 4%, intermediate/sealer 4%, and finish 2%. Intermediate coats (excluding sealer) shall contain not less than 25% natural or synthetic lamellar micaceous iron oxide (MIO), by weight of pigment, in accordance with ASTM D5532, Type I. All coatings shall be lead and chromate free.

SURFACE PREPARATION

Prepare the surfaces to SSPC SP 10, Near White Blast Cleaning, unless stipulated otherwise in the Special Requirements.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature 35°F to 100°F

Dew Point Surface temperature above the dew point no visible moisture or dew present

Relative Humidity 30% to 99%

COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Coating manufacturer addresses and contact numbers are provided after the last Paint System Table. Dry film thickness for this System should be as follows (if the selected manufacturer recommends a different thickness range, provide the recommendation to the Engineer in writing for resolution):

Primer:           3-4 mils  
Sealer\*:         1-2 mils

Intermediate: 3.5 mils  
Finish: 3.4 mils

\*Sealer used for System C' only.

### RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75°F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 24 hours minimum, 30 days maximum

Sealer\* - 24 hours minimum, 30 days maximum

Intermediate - 24 hours minimum, 30 days maximum

Finish - 24 hours minimum, 30 days maximum (additional coats or repairs beyond this time will require abrading by sanding or other means prior to coating application)

\*Sealer used for System C' only.

PAINT SYSTEM C AND C'  
 MOISTURE CURE URETHANE (MCU) ZINC /  
 MCU INTERMEDIATE / MCU FINISH

Manufacturer	Coat	Product
MAB/Aquarius	Prime	Armazinc
	Sealer*	Armabrite 1000
	Intermediate	Armabrite MIO 4500
	Finish	Armabrite 8000
Wasser	Prime	MC Zinc
	Sealer*	MC Prepbond
	Intermediate	MC Ferox B
	Finish	MC Luster
Xymax	Prime	Mono Zinc ME III
	Sealer*	MonoLock PP
	Intermediate	Mono Ferro
	Finish	Max Coat A

\*Note: The sealer is used for System C' only.

PAINT SYSTEM D and D'  
MOISTURE CURE URETHANE (MCU) ALUMINUM  
MCU INTERMEDIATE / MCU FINISH

DESCRIPTION

This system is used for the repainting of existing steel prepared by abrasive blast cleaning or power tool cleaning. It may also be used for overcoating an existing intact system, including cables. System D involves the use of a three coat moisture cure urethane system, with aluminum incorporated into the primer. System D' utilizes the same three coat system, except that a full coat of penetrating sealer is used after the application of the primer (or prior to the primer if specified in the Special Requirements).

PAINT SYSTEM REQUIREMENTS

VOC-compliant system (<335 grams/liter or 2.8 pounds/gallon). Moisture cure urethane (MCU) aluminum primer, MCU intermediate, and MCU aliphatic acrylic urethane finish coat. For System D', an MCU sealer coat is used between the prime and intermediate coats (or prior to the primer if stipulated in the Special Requirements). The sealer material shall be a high solids, low viscosity urethane material. Total coating binder solids of polyisocyanate by weight shall be as follows: primer 4%, sealer/intermediate 4%, and finish 2%. Prime and Intermediate coats (excluding sealer) shall contain not less than 25% natural or synthetic lamellar micaceous iron oxide (MIO), by weight of pigment, in accordance with ASTM D5532, Type I. All coatings shall be lead and chromate free.

SURFACE PREPARATION

When completely replacing a coating system, remove all existing paint in accordance with SSPC SP 6, Commercial Blast Cleaning, unless stipulated otherwise in the Special Requirements. When used for overcoating, prepare localized corrosion and deteriorated coating in accordance with SP 6 or SSPC SP 3, Power Tool Cleaning. Prepare the remaining intact coating by pressure washing.

When used on cables, conduct water washing and scrubbing with stiff bristled non metallic scrub brushes to remove all surface debris, chalk, and loose deteriorated coatings. Do not use pressurized water in excess of 150psi. Supplement the water cleaning with hand tools in accordance with SSPC SP 2, "Hand Tool Cleaning." Use power tool cleaning in accordance with SSPC SP 3, "Power Tool Cleaning" only upon specific approval of the Engineer.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature 35°F to 100°F

Dew Point Surface temperature above the dew point no visible moisture or dew present

Relative Humidity 30% to 99%

## COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Manufacturer addresses and contact numbers are provided after the last Paint System Table. Dry film thickness should be as follows (if the selected manufacturer recommends a different thickness range, provide the range to the Engineer in writing for resolution):

Primer: 2 3 mils  
Sealer\*: 1 2 mils  
Intermediate: 3 5 mils  
Finish: 3 4 mils

\*Sealer used for System D' only (Note, when specified in the Special Requirements, apply the seal coat before the application of the primer rather than after).

## RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75°F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 6 hours minimum, 24 hours maximum

Sealer\* - 24 hours minimum, 30 days maximum

Intermediate - 24 hours minimum, 30 days maximum Finish - 24 hours minimum, 30 days maximum (additional coats or repairs beyond this time will require abrading by sanding or other means prior to coating application)

\*Sealer used for System D' only. (Note, when specified in the Special Requirements, apply the seal coat before the application of the primer rather than after).

PAINT SYSTEM D and D'  
 MOISTURE CURE URETHANE (MCU) ALUMINUM /  
 MCU INTERMEDIATE / MCU FINISH

Manufacturer	Coat	Product
MAB/Aquarius	Prime	Armabrite MIO 4000 AL
	Sealer*	Armabrite 1000
	Intermediate	Armabrite MIO 4500
	Finish	Armabrite 8000
Wasser	Prime	MC M10 Aluminum
	Sealer*	MC Prepbond
	Intermediate	Ferrox B
	Finish	MC Luster
Xymax	Prime	MonoLock PP Aluminum
	Sealer*	MonoLock PP
	Intermediate	Mono Ferro
	Finish	Max Coat A

\*Sealer used for System D' only. When specified in the Special Requirements, apply the seal coat prior to the application of the primer.

PAINT SYSTEM E  
ALKYD / ALKYD / SILICONE ALKYD

DESCRIPTION

This system is used for the spot repair and overcoating of existing intact coatings. The silicone alkyd modification in the finish provides a higher degree of color and gloss retention than an unmodified alkyd.

PAINT SYSTEM REQUIREMENTS

VOC-compliant system (<450 grams/liter or 3.8 pounds/gallon). Medium oil length alkyd primer, and medium oil length alkyd intermediate and finish coats, with a minimum of 30% silicone modification in the finish.

SURFACE PREPARATION

Prepare localized corrosion and deteriorated coating in accordance with SSPC-SP 6, Commercial Blast Cleaning or SSPC SP 3, Power Tool Cleaning, unless stipulated otherwise in the Special Requirements. Prepare the remaining intact coating by pressure washing.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature - 40°F to 100°F

Dew Point - Surface temperature should be at least 5°F above the dew point

Relative Humidity - 30% to 80%

COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Coating manufacturer addresses and contact numbers are provided after the last Paint System Table. Dry film thickness for this System should be as follows (if the selected manufacturer recommends a different thickness range, provide the recommendation to the Engineer in writing for resolution):

Primer: 2 3 mils

Intermediate: 3 5 mils

Finish: 3 4 mils

RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75°F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 12 hours minimum, 30 days maximum

Intermediate - 12 hours minimum, 30 days maximum

Finish - 24 hours minimum, 30 days maximum (additional coats or repairs beyond this time will require abrading by sanding or other means prior to coating application)

PAINT SYSTEM E  
ALKYD / ALKYD / SILICONE ALKYD

Manufacturer	Coat	Product
Carboline	Prime	Multi-Bond 150
	Intermediate	Multi-Bond 150
	Finish	Subsil 30 HS
Keeler & Long	Prime	No. 6040 Tri-Polar White Enamel
	Intermediate	No. 6040 Tri-Polar White Enamel
	Finish	F Series Kolor Sil Enamel
Sherwin Williams	Prime	Kem Bond HS
	Intermediate	Kern Bond HS
	Finish	Steel Master 9500

PAINT SYSTEM F  
ALKYD / ALUMINUM ALKYD

DESCRIPTION

This system is typically used for the spot repair and overcoating of cables.

PAINT SYSTEM REQUIREMENTS

A limited selection of VOC compliant finish coats are available at the 2.8 pound/gallon (335 grams/Liter) threshold, with some materials meeting the 3.8 pound/gallon (450 grams/Liter) level. VOC levels for the finish coats are listed in the tables, but VOC levels should be confirmed for specific products. Medium to long oil length alkyd primer and finish coats shall be provided. Finish coats shall have leafing aluminum pigments. Refer to NYSDOT Standard Specifications Section 708 08 "Ready Mixed Aluminum Paint" and SSPC Paint Specification No. 102 (Leafing Type I) for other requirements of this material.

SURFACE PREPARATION

Conduct water washing and scrubbing of the cables with stiff bristled non metallic scrub brushes to remove all surface debris, chalk, and loose deteriorated coatings. Do not use pressurized water in excess of 150psi. Supplement the water cleaning with hand tools in accordance with SSPC SP 2, "Hand Tool Cleaning." Use power tool cleaning in accordance with SSPC SP 3, "Power Tool Cleaning" only upon specific approval of the Engineer.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature 40°F to 100°F

Dew Point Surface temperature should be at least 5°F above the dew point

Relative Humidity 30% to 80%

COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Coating manufacturer addresses and contact numbers are provided after the last Paint System Table. Dry film thickness for this System should be as follows (if the selected manufacturer recommends a different thickness range, provide the recommendation to the Engineer in writing for resolution):

Primer: 2-4 mils

Finish: 1-1.5 mils

RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75°F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 24 hours minimum, 30 days maximum

Finish - minimum of 24 hours, 30 days maximum

PAINT SYSTEM F  
ALKYD / ALUMINUM ALKYD

<u>Manufacturer</u>	<u>Coat</u>	<u>Product</u>	<u>Finish VOC</u>
Carboline	Prime Finish	Multi Bond 150 Multi Bond 139 Aluminum	2.3/276
Keeler & Long	Prime Finish	No. 6040 Tri Polar White Enamel B 1 Series (0992 Aluminum)	3.0/360
Sherwin Williams	Prime Finish	Kem Bond HS Silver Brite Aluminum	3.8/450

PAINT SYSTEM G  
ALUMINUM EPOXY MASTIC / EPOXY / ACRYLIC ALIPHATIC URETHANE

DESCRIPTION

This system is used for steel that is completely blast cleaned with all coats applied in the field

PAINT SYSTEM REQUIREMENTS

VOC compliant system (<450 grams/liter or 3.8 pounds/gallon). Surface tolerant aluminum epoxy mastic first coat. High build epoxy polyamide intermediate. Aliphatic acrylic urethane finish with total isocyanate group content (by percentage, pigment free basis) shall be 2%. All coatings shall be lead and chromate free.

SURFACE PREPARATION

Prepare the surfaces to an SSPC-SP 6, Commercial Blast Cleaning.

AMBIENT CONDITIONS

Apply the coatings under the following ambient conditions (if the selected manufacturer recommends different requirements, for ambient conditions, provide the recommendations to the Engineer in writing for resolution):

Air and Surface Temperature 50F to 100F  
Dew Point Surface temperature should be at least 5F above the dew point  
Relative Humidity less than 85%

COATING SYSTEMS AND COATING THICKNESS

Coating materials are shown on the next page. Dry film thickness for this System should be as follows (if the selected manufacturer recommends a different thickness range, provide the recommendation to the Engineer in writing for resolution):

Primer: 3.5 mils  
Intermediate: 3.5 mils  
Finish: 2.3 mils

RECOAT TIMES

Maintain the following minimum and maximum recoat times for each coat. These times are based on approximately 75F and 50%RH. If the selected manufacturer recommends different recoat times, provide the recommendation to the Engineer in writing for a resolution.

Primer - 24 hours minimum, 30 days maximum  
Intermediate - 8 hours minimum, 30 days maximum

Finish - 8 hours minimum, 30 days maximum (additional coats or repairs beyond this time will require abrading by sanding or other means prior to coating application)

PAINT SYSTEM G  
ALUMINUM EPOXY MASTIC EPOXY /ALIPHATIC URETHANE

<u>Manufacturer</u>	<u>Coat</u>	<u>Product</u>
Ameron	Primer	Amerlock,400 AL
	Intermediate	Amerlock,400
	Finish	Amercoat 450 HS
Carboline	Prime	Carbomastic 90
	Intermediate	893
	Finish	134 HS
Keeler & Long	Prime	Kolormastic II 1800
	Intermediate	KolorPoxy 3200
	Finish	Acythane Y Series
MAB	Prime	Ply Mastic Epoxy 040
	Intermediate	Ply Tile 520
	Finish	Ply Thane 890HS
Sherwin Williams	Prime	Epoxy Mastic Aluminum II
	Intermediate	Macropoxy 646
	Finish	Acrolon 218 HS

NAMES AND ADDRESSES OF COATING MANUFACTURERS

Ameron

1571 Phoenix Blvd. Suite 5  
Atlanta, GA 30349  
888-239-4064  
Fax: 770-907-1034

Carboline

449 South Ave. East  
Westfield, NJ 07090  
908-233-3150  
Fax: 908-654-0155

DuPont

Wilson Building - Concord Center  
Wilmington, DE 19898

ICI-Devoe Coatings

213 Hopkinson Street  
South Plainfield, NJ 07080  
908-791-9868  
Fax: 908-755-7672

International

6001 Antoine  
Houston, TX 77210 4806  
800-422-1161

Keeler & Long

P.O. Box 460  
865 Echo Lake Road  
Watertown, CT 06795  
860-274-6701  
Fax: 860-274-5857

MAB

31 Grand Boulevard  
Spotswood, NJ 08884  
732-251-1312  
Fax: 732-251-9385

Sherwin Williams

226 Talmadge Road  
Edison, NJ 08818

888-975-0697  
Fax 732-370-8650

Sigma Coatings  
12 Kirkwood Circle  
Brigantine, NJ 08203  
800-241-6686

Tnemec  
P.O. Box 411749  
Kansas City, MO 64141  
818-483-3400  
Fax: 818-483-3969

Wasser  
11 B Rustic Circle  
Montvale, NJ 07645  
201-573-8121  
Fax: 201-573-8121

Xymax  
1058 Edgewood Road  
New Kensington, PA 15068  
724-339-1442  
Fax: 724-339-1465