STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Janet T. Mills
GOVERNOR

Bruce A. Van Note
COMMISSIONER

August 29, 2024
Subject: Cable Rail Replacement
State WIN: 026916.00
Location: Stow & Batchelders Grant
Amendment No. 1

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book:

REMOVE pages 19-20, **Proposal Schedule of Items**, 2 pages dated 7/12/2024, and **REPLACE** with the attached revised Proposal Schedule of Items, 2 pages, dated **8/28/2024**.

Bids will be accepted on either the Schedule of Items contained in the original Bid Book, or the one contained in this amendment. However, the actual accepted bid and original contract amount will be calculated based on the quantities in the attached, revised Schedule of Items.

INSERT, "**SPECIAL PROVISION, SECTION 606, DUPLEX COATING, (Powder Coating Over Galvanized)**10 pages, dated August 28, 2024.

The following questions have been received:

Question: Are there any powder coat specifications the department can provide? On previous projects in Fryeburg and Bar Harbor there was a fairly lengthy specification which only Duncan Galvanizing could meet.

Response: Please see attached Special Provision 606.

Question: Please provide the RAL color chip number (in the past was included with the spec).

Response: Please see the attached Special Provision 606.

Question: The process of getting the guardrail powder coated usually takes 3-4 months. We don't believe its possible to get the material soon enough to complete in this construction season. According to the spec section 105, no work can be conducted from April 1st - June 30th due to Canadian lynx denning season. On page 48 (general notes) read that the department will be closing the road while the work is being completed. If work does not commence until July 2025, will the department still be able to close the road at this time? Or was the intent to close the road after the summer tourist season is over?

Response: The Department anticipates closing the road mid-October to late April. If there is a weather event during the road closure MaineDOT will maintain the roadway, plow, sand etc.

Question: The spec for powder coating in the past has required that the contractor provide a 5 year warranty which caused a lot of issues due to determining what made the powder coat fail - Snow plow, car accident, or poorly applied, etc. Would the department consider putting an inspector at the galvanized and powder coat facility and/or taking a few pieces of guardrail to be tested prior to the contractor installing? If there are any issues with the coating or process, it would be best to find out before it gets to Maine and definitely before it is installed. Most companies are unwilling to warranty their coating once struck by a car/snowplow regardless of how well the coating was applied.

Response: See the attached Special Provision

Question: Special provision 105 (environmental requirements) - according to this section, if the contractor finds a bat (dead or alive) or an active bird nest, all activities must cease. How will the contractor be compensated for any delays due to these requirements if activities must stop for more than one hour? Once equipment and man power is mobilized to this remote location, it would be very costly for the contractor to sit on their hands while waiting for an environmentalist to arrive and assess the situation.

Response: The Contractor and the Department will agree upon an hourly downtime rate and a contract mod will be executed if needed.

Question: There is an item for rock drilling holes, it is listed by the hour. Typically this item is listed per hole. Would the department consider making this change?

Response: Item 910.302 Special Work – Rock Drilling 12” Diameter up to 8’ Depth (Down Hole Hammer) units will be changed to Each. See attached Proposed Schedule of Items.

Question: How much ledge is anticipated? Typical guardrail post embedment is 52" with the exception of the end treatments where the last two posts are embedded 72" in the ground.

Response: The anticipated quantity of ledge is unknown.

Question: Are any extra-long guardrail posts required for this project? (8' overall). Standard 7' overall.

Response: There are no extra-long (8’) guardrail posts anticipated for this project.

Question: Are any of the shoulders paved or are they all gravel? If the shoulders are paved, who is responsible for patching around the guardrail posts? The department or the contractor?

Response: All shoulders are gravel

Question: Is the department going to order any extra/spare material to have on hand for repairs. There is quite a supply of guardrail beam and posts at the MDOT lot on Route 69 in Carmel, but there are no MASH approved end treatments that are powder coated.

Response: No additional MASH approved ends will be ordered.

Question: Is the department planning on closing the road for the entire 2025 year

Response: No, MaineDOT anticipates closing the road from mid-October to late April.

Consider these changes and information prior to submitting your bid on September 4**, 2024**.

Sincerely,

George M. A. Macdougall P.E.
Contracts & Specifications Engineer

Maine Department of Transportation

Proposal Schedule of Items

Proposal ID: 026916.00 **Project(s):** 026916.00

SECTION: 1 PROJECT ITEMS

Alt Set ID: **Alt Mbr ID:**

Contractor: _____

Proposal Line Number	Item ID / Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
0010	606.1311 31" W-BEAM GUARDRAIL, MIDWAY-SPLICE, SINGLE FACED, POWDER COATED	10,977.000 LF				
0020	606.1313 31" W-BEAM GUARDRAIL, MID-WAY SPLICE, 15' RADIUS AND LESS, POWDER COATED	75.000 LF				
0030	606.1314 31" W-BEAM GUARDRAIL, MID-WAY SPLICE, OVER 15' RADIUS, POWDER COATED	75.000 LF				
0040	606.1316 31" W-BEAM GUARDRAIL, MID-WAY SPLICE, TANGENT TERMINAL, POWDER COATED	51.000 EA				
0050	606.2650 TERMINAL END- SINGLE RAIL, POWDER COATED	1.000 EA				
0060	659.10 MOBILIZATION	LUMP SUM	LUMP SUM			
0070	910.30 SPECIAL WORK - ROCK DRILLING 12" DIAMETER UP TO 8' DEPTH (DOWN HOLE HAMMER)	8.000 EA				

Section: 1 **Total:**

Total Bid:

Maine Department of Transportation

Proposal Schedule of Items

Proposal ID: 026919.00 **Project(s):** 026916.00

SECTION: 1

Alt Set ID: **Alt Mbr ID:**

Contractor: _____

By signing below, the Bidder (1) represents that the Bidder has examined the Contract Agreement contained in the Bid Documents, the Contract, all documents referenced in said Contract, and the site and scope of work, (2) does hereby bid and offer to enter into this contract to construct and/or perform the Work in strict accordance with the terms and conditions of this Contract at the unit prices bid in the attached "Schedule of Items", (3) represents that the Bidder has given the Department notice of any errors or ambiguities related to the documents or the work that have been discovered by the Bidder, (4) represents that the above-named organization is the legal entity entering into the resulting contract with the Department if they are awarded the contract and, (5) represents that the undersigned is authorized to enter contractual obligations on behalf of the above-named organization.

Bidder acknowledges that the properly completed and signed Schedule of Items provided with the Bid constitutes the Bidder's offer and that this offer shall remain open for 30 calendar days after the date of opening of bids.

The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

Use pen and ink to complete paper bids. Signatures shall be original. Stamped and copied signatures will not be accepted.

_____ _____
Signature Date

_____
(Print Bidder's Name and Title)

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

Important:

Apply galvanizing and powder coating within the same facility (see 1.2);
Apply first powder coating over galvanizing within a maximum 12-hour window (see 3.4.1).

DESCRIPTION

1.1 General. This work shall be a duplex coating, consisting of hot dip galvanizing and high-performance, shop- applied, thermosetting-based, super-durable powder coating, for fabricated steel products for exterior use, as shown on the plans or as directed.

1.2 Duplex Coating Facility. The galvanizer shall be qualified and have demonstrated a minimum of ten years experience in the successful application of hot dip galvanizing using the dry kettle process, and a minimum of five years experience in the successful application of powder coatings over galvanizing within the same facility.

1.3 Scope of Work. All fabricated products and components, as shown on the plans or as directed, shall be furnished with a duplex coating as described. The duplex coating system shall consist of Hot Dip Galvanizing, Durable powder primer, Super durable powder topcoat, and powder clear coat.

MATERIALS

2.1 Galvanizing. Hot dip galvanizing shall conform to AASHTO M111 (ASTM A123) and Maine DOT Standard Specifications, Section 506.20, and utilize the dry kettle process in a bath of molten zinc. The galvanizing kettle shall contain special high grade zinc, nickel, and other earthly materials. Quenching with water or treatment with a chromate conversion coating is prohibited. Provide the thickness of galvanizing specified in the reference standards. Hardware shall be hot dip galvanized in conformance with AASHTO M232 (ASTM A153). Repairs to the galvanizing shall be in conformance with ASTM A-780 and Section 506.22.

2.2 Abrasives. Provide abrasives that are dry and free of oil, grease, and corrosion-producing, or other deleterious contaminants. Provide an abrasive that is sized to produce a dense, consistent, sharp, angular, uniform anchor pattern with a profile height of 1.0-1.5 mils, unless the requirements of the coating manufacturer are more restrictive. The use of iron shot, steel shot, aluminum oxide grit, sand, or coal slag products as blast abrasives, and power wire brushes are NOT permitted. Use approved abrasives [e.g. garnet, stainless steel grit, DuPont StarBlast® XL (fractured), etc.] that will not leave a residue on the galvanized surface after blowing down with compressed air.

2.3 Powder Coating. The duplex coating shall be a two-coat shop-applied, oven-cured, high performance, exterior thermosetting powder coating consisting of a durable zinc-rich powder coating primer,

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

and a super-durable powder coating topcoat applied over hot dipped galvanized (HDG) steel substrates. For extra protection a third coat consisting of a powder clearcoat shall be applied. Fasteners exposed to view after installation shall receive duplex coating per section 3.4.4 and 3.7.4.

2.3.1 Furnish powder coating materials from one of the following approved suppliers:

1. AkzoNobel
2. PPG
3. Sherwin Williams
4. TIGER Drylac

2.3.2 The powder coating manufacturer shall certify in writing that:

1. The duplex coating facility applying the powder coating is certified to apply the powder by the coating manufacturer;
2. The powder coating meets or exceeds the following minimum performance requirements for use over hot dip galvanized surfaces:

Powder Coating - Minimum Performance Requirements

Test	Powder Primer	Powder Topcoat
Thickness (SSPC PA2)	3 mils (min.)	5 mils (min.)
Adhesion (ASTM D4541)	1050 psi (min)	1050 psi (min)
Impact Resistance (ASTM D2794 Direct)	160 in. lbs.	160 in. lbs.
Flexibility (ASTM D522,	pass	pass
Pencil Hardness (ASTM D3363)	3B	2H
Humidity (ASTM D4585) 100º F, 2000 hrs	Pass, no cracking or delamination	Pass, no cracking or delamination
Corrosion Weathering (ASTM D5894, 13 cycles, 4000 hours)	blister rating: 10 rust rating: 7	
Dry Heat Resistance (ASTM D2485)	250º F	
Abrasion Resistance (ASTM D4060	200 mg loss (max)	

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

Salt Spray (ASTM B117) 2000 hrs		pass
Color Retention (ASTM D2244) 10 years		3ΔE (based on inorganic resins)
Chalk Resistance (ASTM D4214)		none
Gloss Retention (ASTM D523) 10 years		45% loss (max)
Xenon Arc Test (ASTM D 4798) 400 hrs		pass

2.3.3 Provide each coat of powder coating in sufficiently contrasting color to facilitate proper coverage and to distinguish it from previously applied coatings. The previous coat shall be hidden by application of each coat at the specified minimum thickness.

2.3.4 Provide all powder coating materials in sealed, original, containers that are properly marked to allow verification, with applicable material safety data sheets, application instructions and precautions, including the manufacturer's name, type of material, brand name, color, shelf life, purchase order number, lot and batch numbers, and quantity.

2.3.5 The final color of the painted product shall be a medium brown, Federal Standard #30117 or RAL #8024, with a matte finish.

2.3.6 Repair and touch-up materials shall be supplied by the powder coating applicator and applied in accordance with the powder coating manufacturer's recommendations.

DUPLEX COATINGS

3.1 General

3.1.1 Provide all materials, equipment, and labor necessary to perform the scope of work whether or not the material or equipment is specifically identified in this Item. Conduct all galvanizing, surface preparation, powder coating operations, handling, shipment, and installation in a workmanlike manner in conformance with SSPC-PA1, these requirements, and to the reasonable satisfaction of the Department.

3.1.2 Basis of Design. This specification is based on the standard of quality and performance of the powder coating duplex system provided by Duncan Galvanizing.

3.1.3 Specifications. Perform the work in conformance to the Contract requirements, the reference standards, and the coating manufacturer's instructions, respectively.

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

3.1.4 Reference Standards. The latest edition of the standards and regulations in effect at the time of the Bid, form a part of this Specification. A copy of the reference standards applicable to the work shall be available at the Department's request.

a. American Society for Testing and Materials (ASTM)

1. ASTM A123, Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
2. ASTM A153, Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
3. ASTM A385, Standard Practice for Providing High-Quality Zinc Coatings (Hot Dip)
4. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings
5. ASTM D610, Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces
6. ASTM D6386, Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

b. American Association of State Highway & Transportation Officials (AASHTO)

1. AASHTO M111, Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
2. AASHTO M232, Zinc Coating (Hot Dip) on Iron and Steel Hardware

c. American Galvanizers Association (AGA)

1. The Inspection of Products Hot Dip Galvanized After Fabrication
2. *Powder Coating over Hot Dip Galvanized Steel*, Powder Coating Journal, Feb 2004, Philip Rahrig, AGA Executive Director
3. *Powder Coating over Galvanized Steel*, Tom Langill, AGA Technical Director, Feb 2010.

d. Society for Protective Coatings (SSPC)

1. SSPC-SP 1, Solvent Cleaning
2. SSPC-SP 7 / NACE No. 4, Brush Off Blast Cleaning
3. SSPC-PA 1, Shop, Field, and Maintenance Painting
4. SSPC-PA 2, Measurement of Dry Film Thickness with Magnetic Gages

3.1.5 Submittals.

3.1.5.1 Surface Preparation and Powder Coating Plan.

1. Provide a written plan to the Department for applying duplex coatings. Identify the manner of surface preparation, the powder coat system to be applied, film thickness, cure time between coats, repair materials and procedures of typical damage and defects in the duplex coating, and other information needed to successfully apply all coats of the duplex system.
2. Provide material product literature and MSD sheets for the coatings specified, along with test data indicating conformance to the performance criteria required.

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

3. Submit six - 3-inch by 6-inch samples of shop-applied duplex coatings and colors proposed for use for approval to the Department a minimum four weeks prior to coating application. Samples shall be made of the same or comparable material and thickness as production pieces.
4. Submit a Certificate of Compliance stating that the requirements of the contract specifications have been met, in conformance to 106.04.

3.1.5.2 Substitutions or Approved Equals.

1. Substitutions or 'Approved Equals' are defined as meeting the aesthetic, durability, and all other performance criteria described in this specification, and shall be accompanied by proof that the Substitution or 'Approved Equal' meets or exceeds these criteria. Approval is the discretion of the Department. Coatings or processes not matching or exceeding the approved specified process and aesthetic, durability, and performance criteria shall be removed and replaced at the expense of the Contractor and all Subcontractors that were involved with the supply of and application of the non-conforming product.

3.1.6 Supplier Coordination.

1. **Fabricator-Galvanizer Coordination**. Prior to fabrication and final submittal of shop drawings to the Department, fabricators shall submit shop drawings to the galvanizer for all metal fabrications to receive shop- applied duplex coatings, to review fabricator's shop drawings for suitability of materials for galvanizing and coatings, and to coordinate any required modifications to fabrications required to be performed by the fabricator.
2. The supplier of steel products shall notify the galvanizer if the chemical composition of the steel to be galvanized exceeds the following limits in order to determine its suitability for processing: 0.25% carbon, 0.22% silicon, 0.04% phosphorous, and 1.3% manganese.

3.2 Hot Dip Galvanizing (HDG)

3.2.1 Fabricated products shall meet the requirements of ASTM A385 (for material composition, cleanliness, drainage vents, etc.) prior to galvanizing, and galvanized surfaces shall meet the requirements of ASTM D6386 (preparing zinc surfaces for painting), as applicable and as stated herein.

1. Galvanizing: Galvanize materials in accordance with specified standards and this specification. Galvanizing shall provide an acceptable substrate for applied coatings. The dry kettle process shall be used to eliminate any flux inclusions on the surface of the galvanized material.
2. Prior to galvanizing, the steel shall be immersed in a preflux solution (zinc ammonium

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

chloride). The wet kettle process is prohibited.

3. Implement the following procedures to provide the appropriate surface for the material to be galvanized:
    a) Utilize and regularly inspect a monitoring recorder to observe any variances in the galvanizing bath temperature.
    b) The pickling tanks shall contain hydrochloric acid. Titrations shall be taken weekly at a minimum.
    c) All chemicals and zinc content will be tested at least once a week to determine compliance with ASTM standards. All testing will be done using atomic absorption spectrometry or x-ray fluorescence (XRF) equipment at a lab in the galvanizing plant.

3.2.2 Surface Preparation of Hot Dip Galvanizing (HDG)

1. Prepare all surfaces in conformance to the requirements of this Item, and the applicable Surface Preparation/Powder coating Plan provided under MaineDOT Standard Specifications, Section 506.13, Submittals.
2. Prior to powder coating, clean and prepare galvanized surfaces as necessary to remove detrimental contaminants. (See *Powder Coating over Galvanized Steel*, Feb 2010 Tom Langill for cautions regarding cleaning.) If applicable apply cleaning materials with clean lint-free rags or soft bristle brushes frequently changed to prevent reapplying contaminants. After cleaning, rinse thoroughly with hot water and allow the part to dry completely.
3. Prepare galvanized surfaces with SSPC, SP 16 Brush-Off Blast Cleaning, using non-metallic abrasives at a reduced nozzle pressure as recommended by the equipment manufacturer, or abraded by approved mechanical means using sanding disks with appropriate abrasive, to thoroughly roughen the entire surface and produce a dense, consistent, sharp, angular, uniform anchor pattern with a profile height of 1.0-1.5 mils, exhibiting a uniform gray color free of any bright, shiny spangles and to an appearance and feel similar to sandpaper.

4. The required thickness of the zinc coating shall be maintained and checked prior to powder coating. Surface preparation shall be acceptable to the powder coating manufacturer's requirements. Additional surface preparation or a tie coat may be considered if required by the powder coating manufacturer and approved by the Department.
5. The substrate surface shall be dry and free from dust, dirt, oil, grease or other contaminants.

3.2.3. Discontinuities. All visually evident detrimental surface imperfections (e.g. flux inclusions,

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

dross inclusions, oil) that are present on galvanized surfaces shall be cleaned, and any high spots, rough areas and edges, spikes, and sharp protrusions shall be removed by grinding to produce a smooth surface. Disbondment (peeling) of galvanizing is not acceptable and the piece shall be regalvanized, or investigated for extent and severity and a repair solution proposed to the Department for approval before corrective action is taken.

3.2.4 Surface profiling shall be performed prior to the formation of "white rust" on the galvanized surface. If any "white rust" is detected by visual means, the galvanizing shall be stripped off and the steel re-galvanized in conformance with these specifications. "White rust" shall be as defined in the Inspection of Products Hot Dip Galvanized After Fabrication, Table IV, by the American Galvanizers Association.

3.2.5 Prior to powder coating galvanized products shall not be nested, stacked or stored with adjacent surfaces touching but shall be kept separated to be remain dry and permit the circulation of air between products.

3.3 Galvanized Steel Outgassing.

3.3.1 The galvanized parts shall be subjected to a thermal cycle (i.e. outgassing) after surface profiling and before powder coating application. The thermal cycle should be set at the appropriate temperature and duration for the thickness of the product recommended by the powder coating manufacturer.

3.4 Powder Coat Application.

3.4.1 Time limits. The first coat of powder coating shall be applied within twelve (12) hours of galvanizing and within one hour of surface preparation of the galvanized surface and outgassing, at the galvanizer’s facility, and in a controlled environment meeting applicable atmospheric requirements, as recommended by the coating manufacturer.

3.4.2 Powder coating application. Pretreatment and powder coating application and curing shall be performed after galvanizing in conformance with the powder coating manufacturer's recommendations and shall consist of the following, unless approved otherwise:

1. Verify that the galvanized surface exhibits the specified degree of cleaning immediately prior to powder coating.
2. The coating and curing facility shall be maintained free of airborne dust and dirt until coatings are completely cured.
3. The powder coating shall be electrostatically applied according to the coating manufacturer's written specifications, maintaining even coverage on all parts. The powder shall

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

only be applied when both the ambient temperature is 65º F. or above, and the part surface temperature is between 60º and 95º F., and is (min.) 5º F. higher than the dew point. Relative humidity shall be less than 85 percent (max.).

4. After applying the powder, all parts shall be placed in an oven, cured and bonded at the manufacturer's recommended levels (e.g. approximately 392º F. for 25 minutes). The Contractor shall ensure that a stable transfer exists between the powder application system and the curing oven to prevent the loss of powder from the parts.
5. The powder coating shall be applied to a minimum dry film thickness of 3 mils primer and 5 mils topcoat, and in a manner that will ensure a uniform coating without holidays, runs, or detrimental build at edges. A clear coat shall be applied at the manufacturer's recommended thickness.
6. Each coated part shall be visually inspected. Measure the coating thickness with a thickness gauge. Any part that does meet the specified coating thickness may be recoated immediately after lightly abrading (sanding) the surface. Once cured, all parts shall be allowed to cool sufficiently before further handling.

3.4.3 Surface smoothness - Duplex coatings shall exhibit a smoothness (i.e. rugosity) not greater than 4 rug (16-20 microns of variation) when measured by a profilometer over a 1-inch straight line on the surface of metal products less than 24 lbs/ linear foot. The profilometer shall be capable of operating in 1 micron increments.

3.4.4 Hardware shall be galvanized and powder coated as follows. Furnish an application procedure to the Department. Coating procedures for fasteners are not restricted to the same-facility (1.2) and 12-hour maximum window (3.3.1) restrictions, due to the different nature of fastener supply.

1. Bolts - Powder coat bolt heads. Minor overspray is permitted on the threads.
2. Nuts - Powder coat exterior nut surfaces and mask off interior surfaces.
3. Washers - Powder coat all washer surfaces.

3.5 Inspection.

3.5.1 Quality Control (QC). The applicator is required to conduct and document quality control inspection of the cleaning and powder coating operations including at a minimum, measurements of surface profile, surface cleanliness, dry film coating thickness, and visual inspection for coating defects. The data shall be recorded in a log maintained at the site and available for the Department's review during working hours.

3.5.2 Quality Assurance (QA). The work is subject to QA inspection by the Department.

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

1. Facilitate QA inspection as required, including proper notification, allowing adequate time for inspections, and providing access to the work. Furnish, until final acceptance of the coating system, all equipment, reference documents, and instrumentation needed to inspect all phases of the work.
2. Measure the thickness of each coat using nondestructive magnetic dry film thickness gages. Comply with SSPC- PA2 for the calibration and use of gages and the minimum frequency of thickness measurements. QA Inspectors will not be limited by the frequency of thickness measurements of PA2 but will take measurements sufficient to assure that proper thickness is achieved on all surfaces as specified.
3. The presence or activity of Department QA inspections in no way relieves the Contractor of the responsibility to comply with all requirements of this Item, and to provide adequate inspections of its own to assure compliance with the requirements of this Item.
4. Finished products will be stamped "Approved" only after the loading has been completed and approved. No material shall be shipped without the prior approval of the Department.

3.6 Handling / Shipping / Installation.

3.6.1. Duplex-coated materials shall not be lifted, placed on supports, or loaded for shipment until the shop coating has been adequately cured and inspected.

3.6.2. Protective measures. Exercise care in handling shop-coated materials in the shop, and during storage, shipping, field installation, and subsequent construction to protect the coating from any scraping, marring, or other damage to the surface finish. Coated material shall be insulated from lifting devices and from the scraping and rubbing of parts that would damage the coating, by the use of lifting softeners, nylon slings, padded cables, storage pallets, separators, cushioners, tie-downs, and other approved supports. Individual parts shall be wrapped or padded with effective protective material (e.g. foam, not paper or cardboard).

3.6.3. Installation. Comply with fabricator's and galvanizer's requirements for installation of materials and fabrications, including use of nylon slings or padded cables for handling shop-coated materials.

3.7 Touch-Up And Repairs.

3.7.1 The total repair area shall be less than one quarter of one percent (0.25%) of the area of an individual member, or the member shall be rejected and regalvanized and recoated with the duplex coating. [The repair area definition is comparable to Rust Grade 7 in ASTM D610, *Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces.*]

3.7.2 HDG- Repair damaged galvanizing and bare steel surfaces in accordance with ASTM A780, Standard Practice for Repair of Damaged Hot Dipped Galvanized Coatings, Annex A2. Thoroughly

SPECIAL PROVISION
SECTION 606
DUPLEX COATING
(POWDER COATING OVER GALVANIZING)

clean damaged areas to produce a clean, bare and dry bright metal surface with a roughened profile and feather into the edges of adjacent undamaged galvanizing. Use a power sanding disk per SSPC-SP3. For bolts use a thorough hand wire brushing and SP1 cleaning as a minimum.

3.7.3 Apply an approved organic zinc-rich repair paint containing 92 percent (min.) zinc by weight in the dry film, according to the manufacturer's recommendations, in two to four coats to a thickness equivalent to the surrounding galvanizing. Silver paint, brite paint, or aluminum paint is not acceptable.

3.7.4 Powder coating - The repair to the powder coat may be a liquid and brushed on or an aerosol and sprayed, whichever is appropriate to achieve an aesthetic finish and as long as the coats, cure, and minimum thickness of the original system are achieved. The Contractor shall provide a dry film thickness gage and check the thickness of the repair areas. Touch-ups shall be such that the repair is not noticeably visible from a distance of six feet.

1. The field-touch-up of shop-applied finish coatings shall be performed or supervised by personnel from the duplex coating facility for the warranty to apply.
2. Touch up fasteners in the field after installation, assuming there may be mechanical damage to nuts during tensioning fasteners.
3. Touch-up repair kits in sufficient quantity and touchup instructions shall be provided to the field for each type of shop-applied finish. Additional touchup repair kits and instructions shall be furnished to the Department for use after project acceptance for maintenance repairs.

3.8 Final Acceptance.

Although the Department's QA Inspector may accept the finished duplex coated fabricated products before shipment to the jobsite, final acceptance of the duplex coat system by the Department will occur at the jobsite after installation of the product, and after all coats and repairs have been completed.