



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

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLE
COMMISSIONER

May 9, 2007
Subject: **Brewer**
Project No. FBD-9840(100)X
Pin No. 9840.10
Amendment No. 1

Dear Sir/Ms:

Please make the following changes to the Bid Documents:

In the Bid Book, on the: "Notice to Contractors" page, within the first paragraph, CHANGE the second sentence to read: "Bids will be accepted from contractors prequalified by the Department of Transportation for Highway or Bridge projects." Make this change in pen and ink.

ADD the attached: "Special Provision' Section 507, Steel Pipe Hand Railings" sixteen pages total, dated May 1, 2007

On page fifty titled: "Special Provision-Technical, Section 542, Steel Sheet Piling" under sub-section: "542.03 Materials" DELETE in its entirety paragraph A. on page fifty-one that begins: "Sheet piles shall be structural..." and REPLACE with the following: "A. Sheet piling shall be hot-rolled steel meeting the chemical and mechanical requirements of ASTM A 572 Grade 50. The interlock of sheet piling shall be free sliding, and maintain continuous interlocking when installed. Sheet piling including special fabricated sections shall be full length sections of the dimensions shown. Fabricated sections shall conform to the requirements herein and the piling manufacturer's recommendations for fabricated sections. Provide sheet piling with standard pulling holes. Metalwork fabrication for sheet piling, sections, tie rods and high strength bolts shall conform to the requirements of Section 504, Structural Steel." Make this change in pen and ink.

In the Plan Sheets, on sheet G-02 titled: "Tables, Abbreviations, and Notes" under "Project Notes, General" ADD the following note eighteen: "18. The large stones/rocks along the top of the river bank between Station 38+50+/- and Station 41+00+/- (old Brewer Public Works Building site) shall remain the property of the City of Brewer. The Contractor shall move and pile the stones back on the lot. The work, labor, equipment and materials required to do this work will not be paid for directly, but will be considered incidental to related contract items." Make this change in pen and ink.



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On sheet G-02 titled: "Tables, Abbreviations, and Notes" under "Project Notes, General" ADD the following note nineteen: "19. The proposed work in front of the Muddy Rudder Restaurant between Station 51+50 and Station 56+00 cannot be constructed from June 1 to September 30 in 2007 or 2008 as not to disrupt outdoor functions at the Muddy Rudder. Should the contractor perform the work in this area between October 1, 2007 and May 31, 2008, the work will be completed such that the facility is acceptable for outdoor functions as approved by the engineer in the field." Make this change in pen and ink.

On sheet G-02 titled: "Tables, Abbreviations, and Notes" under "Project Notes, Steel Sheet Pile Bulkhead" under sub-section "D- Sheet Pile Corrosion Protection" DELETE in its entirety note two that begins: "Coating system shall be..." and REPLACE with the following: "Coating system shall be Fusion Bonded Epoxy Coating, Dark Brown. See Special Provision Section 542." Make this change in pen and ink.

The following questions have been received.

Question: Will cold rolled sheet piling be accepted?

Response: No.

Question: Project Specification indicates fusion bond epoxy coating system, but project note steel sheet pile bulkhead D.2 indicates coal tar epoxy. Which coating system will be required?

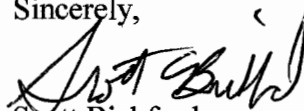
Response: See change made earlier in this amendment.

Question: Could the specification of both A 690 marine grade steel sheet piling as well as coating be verified? Typically it is either marine grade or coated unless a redundant system is wanted.

Response: See change made earlier in this amendment.

Consider this information and changes prior to submitting your bid on May 16, 2007.

Sincerely,



Scott Bickford

Contracts & Specifications Engineer

SPECIAL PROVISIONS

SECTION 507

RAILINGS

(Steel Pipe Handrailing)

507.01 Description: Delete the words “bridge rail” and “and barrier mounted bridge rail”.

507.02 Materials: Delete this section and insert the following:

507.02 Materials

A. General

1. Provide only new materials, free from defects impairing strength, durability, or appearance and of the quality specified.
2. Standard products meeting the detailed requirements specified in this Section will be considered for approval by the Engineer.
3. Furnish all supplemental parts necessary to complete each item whether or not such parts are shown or specified. Furnish all fastenings for securing the work required in this Section to the work of other trades. Furnish, deliver, and pay for the costs of furnishing and delivery under the work of this Section. Installation of all fastening devices on the job site shall be paid for under the work of other Sections.
4. Provide fastenings of the same material, color, and finish as the metal to which applied unless otherwise indicated.

B. Metals

1. Stainless Steel:
 - a. Pipe and tubing shall conform to Schedule 10s, or as otherwise indicated on the drawings, Type 316 circular stainless steel meeting the requirements of ASTM A312/A312M-00.
 - b. Bar stock shall conform to ASTM A276-98B Type 316.
 - c. Anchor bolts shall be ASTM 276 Type 316.
 - d. Stainless steel hardware shall be AISI Type 316 conforming to the requirements of ASTM A193M-99A, Identification Symbol B8M, B8MA, B8M2, or B8M3.

- e. Stainless steel finish shall be No. 4 unless specified otherwise. Stainless steel shall have a surface roughness of 0.5 microns or less with stippled or brushed texture.

2. Structural:

- a. Tubular shapes shall conform to ASTM A 500, grade B
- b. Bars, plates, and angles shall conform to ASTM A36
- c. Pipes shall conform to ASTM A501 or ASTM A53, Types E or S, grade B
- d. Cast iron shall conform to ASTM A48-94 Class 35A for cast gray iron. Cast components shall have surfaces free from injurious defects and burnt-on sand, and shall be reasonably smooth, all in conformance with industry standards for "Ornamental Castings". Runners, risers, fins, and other cast-on variations from the design shall be removed by grinding followed by shot-blasting, except that in no case shall striations caused by grinding be visible nor shall projections be removed closer than 3/32 inches above the cast surface as drawn. Repairs made by welding to restore the thickness or surface relief of the casting will not be permitted. Cast iron components for the railing shall be welded directly to the posts of the railing in locations shown on the Contract Documents prior to galvanizing.

C. Galvanizing

- 1. All steel and cast iron components of the metal railing including hardware, attachments, or other specified steel elements shall be galvanized and said galvanizing shall conform to the following specifications. Do not galvanize stainless steel components.
- 2. Prior to galvanizing, all specified metal items shall be cleaned (pickled) in accordance with SSPC-SP8. Cleaning shall remove all rust, scale, and coating surface must be clean, dry, undamaged, and free of all loose rust, dirt, grease, or other contaminants including salt deposits. Specified metal items calling for galvanizing shall be hot-dipped galvanized after fabrication and chromated after galvanizing by dipping in a 0.15 percent chromic acid solution. Galvanizing bath shall contain 0.05 – 0.09 percent nickel. Galvanize all ferrous fasteners, clips, sleeves, anchors, and accessories in contact with galvanized items.
- 3. Galvanizing shall comply with ASTM A123-M97A, A153/A153M-98, ASTM A385-00 as applicable.
- 4. All galvanized materials shall be inspected for compliance with these specifications and marked with a stamp indicating the name of the galvanizer,

the ASTM Specification, and the weight of the zinc coating in ounces per square foot.

5. Unless otherwise indicated, all items to be galvanized under this Section shall receive a 3-mil coating of zinc.
6. Items to be galvanized shall be galvanized after fabrication. Where size of assembly is too large for complete unit galvanizing, these assemblies shall be galvanized prior to fabrication in as large sections as practical and then only with the written approval of the Engineer.
7. Touch-Up and Repair: For damaged and field welded zinc-coated surfaces, clean welds, bolted connections, and abraded areas.
 - a. At galvanized surfaces, apply organic zinc repair paint complying with requirements of ASTM A780. Galvanizing repair paint shall have 65-percent zinc by weight and shall be from the same source manufacturer of the accepted paint coating system specified. Intermixing of materials within and between coating systems will not be permitted. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or A153 as applicable. Touch-up of galvanized surfaces with aerosol spray, silver paint, bright paint, or aluminum paints is not acceptable.
8. Following galvanizing, each item shall receive surface grinding to remove lumps, sags, or spikes resultant from the galvanizing process. The finished surface following grinding shall be hand smooth and without irregularities. Take care not to damage the galvanized surface coating.
9. Coordinate galvanizing and shipping site metal items with the requirements for painting of metal items as noted in this Specification. Metal items that are fabricated and galvanized under this Section, shall be prime painted within 12 hours of the galvanizing operation.

D. Painting

1. Paint Coatings

- a. Touch-up paint for field touch-up of galvanized surfaces shall be a two-component, moisture, cured, zinc-rich inorganic or organic primer. Recommended Dry Film Thickness shall be as recommended by manufacturer and approved by Engineer. Acceptable products and their manufacturers shall include the following:

1. Ply-Thane 890 HS Coating
Manufactured by M.A.B. Industrial Coatings
Broomhall, PA 19008
 2. Dimetcote 9
Ameron International
Alpharetta, GA 30004
 3. Metallhide 97-673 Series, 1001 Inorganic Zinc Rich Coating
PPG Architectural Finishes, Inc.
One PPG Place
Pittsburgh, PA 15272
 4. Zinc Clad III HS, Organic Zinc-Rich Epoxy Primer
Sherwin-Williams Company
www.sherwin-williams.com
 5. MC Zinc
Wasser High-Tech Coatings
Kent, WA 98032
- b. Primer coating for shop painting of galvanized surfaces shall be an epoxy or urethane coating. Recommended Dry Film Thickness shall be as recommended by manufacturer and approved by Engineer. Acceptable products and their manufactures shall include the following:
1. Ply-Thane 520-W-45 Epoxy Primer
Manufactured by M.A.B. Industrial Coatings
Broomhall, PA 19008
 2. Amercoat 385
Ameron International
Alpharetta, GA 30004
 3. Pitt-Guard 97-946 Series All Weather Direct-to-Rust Epoxy Coatings
PPG Architectural Finishes, Inc.
One PPG Place
Pittsburgh, PA 15272
 4. Macropoxy 646 Fast Cure Epoxy
Sherwin-Williams Company
www.sherwin-williams.com
 5. MC-Ferrox B
Wasser High-Tech Coatings
Kent, WA 98032

c. Finish over epoxy or urethane coating and stainless shall be an aliphatic urethane coating. Recommended Dry Film Thickness shall be as recommended by manufacturer and approved by Engineer. Acceptable products and their manufactures shall include the following:

1. Ply-Thane 890 HS Coating
 Manufactured by M.A.B. Industrial Coatings
 Broomhall, PA 19008
2. Amercoat 450HS
 Ameron International
 Alpharetta, GA 30004
3. Pitthane II
 PPG Architectural Finishes, Inc.
 One PPG Place
 Pittsburgh, PA 15272
4. Acrolon 218 HS Acrylic Polyurethane
 Sherwin-Williams Company
www.sherwin-williams.com
5. MC-Ferrox A
 Wasser High-Tech Coatings
 Kent, WA 98032

Surface Preparation: Coat over preceding epoxy or urethane coat within 24 hours.

d. Colors for the Metal Guardrail shall be as shown on the Drawings and as noted in the table below. All hardware shall be painted in corresponding color as adjacent members or finish stainless steel as noted on the Drawings.

Color	Steel Members
Gloss Black	Post, panel frame members, and all other miscellaneous members not noted above or as designated as “finish stainless steel”.

E. Anchoring Systems

1. Grout as required for anchoring shall be a pourable, quick setting, non-metallic and non-shrinking hydraulic cement grout equal to the following:

- a. Five Star Grout
US Grout Corporation
425 Stillson Road
Fairfield CT 06430
(800) 243-2206
 - b. Sika Grout 212
Sika Corporation
Lyndhurst NJ 07071
(201) 933-8800
 - c. Harris Construction Grout
AH Harris & Sons
10 West Mill Street
Medfield MA 02052
(508) 359-7321
2. Ferrules for use in anchoring moveable metal railing posts shall be galvanized steel ferrules suitable for use in cast-in-place concrete conditions where ferrule is fully integrated with concrete steel reinforcement. Ferrules shall provide 240 MPa yield strength per bolt. Ferrules shall be ¾ inch inside diameter size with threaded embedment no less than 3 inch depth below concrete surface.
 - a. Provide ¾-inch stainless steel, allen-headed, threaded plugs to be screwed into the open ferrules when temporary posts of metal rail system have been removed. Provide no less than 50 plugs for use by Owner.

507.03 Drawings: Insert the following

A. Submittals

1. Constructed Samples
 - a. Fabricate and submit samples of the following items fabricated under this Section, showing workmanship for welds, joints, hardware, colors, and finishing. Samples shall be fabricated per approved Shop Drawings or approved product literature catalogue sheets. These samples may not be part of the finished work. Upon approval, samples shall be the standard of quality for all site metal items fabricated under this Section.
 1. 18" x 18" square constructed sample of the typical Rail Panel including five (5) Pickets and a 24"-inch long segment of the Stainless Steel "Arc" piece attached to the Pickets.
 2. Top 12" portion of the typical Post assembly including both sides of the Post panels, the Stainless Steel Handrail and the Collar pieces

around the Handrail insert. All members shall be to the dimensions shown on the Drawings and in the colors and finishes as specified. Include all hardware and fastening connections/ welding required for the assembly.

3. Top 12" portion of the Corner Post assembly including the L-shaped Post panel, a 6"-long segment of the 90 degree Stainless Steel Handrail and the Collar pieces around the Handrail. All members shall be to the dimensions shown on the Drawings and in the colors and finishes as specified. Include all hardware and fastening connections/welding required for the assembly.

2. Shop Drawings

- a. Submit complete shop drawings of all metal railings work required under this Section, for Engineer's approval. Include plans, sections, and details as required to show all materials, layout, dimensions, jointing, and structural connections for all items required.
 - b. Shop drawings for site metal items requiring accurate dimensional relationships to newly built or as-built construction shall be prepared following a review and confirmation of existing conditions to remain. Provide same for existing or as-built measurements and conditions for areas scheduled to receive miscellaneous metal items by the installer.
 - c. Coordinate the location of all galvanizing vent holes with the galvanizer. Show locations of all vent holes on the Shop Drawings for approval by the Engineer.
3. A notarized statement of compliance with specifications shall be furnished to the Engineer by the galvanizer with the initial shipment of galvanized metal items. The notarized statement shall indicate that the galvanized metal items comply with the ASTM Standard and that the dry kettle method with zinc-nickel alloy was used. Stamp a representative number of pieces of galvanized metal work. The notarized statement shall declare the day each piece was galvanized. The stamp shall indicate the ASTM Standard and the coating weight.
 4. The Contractor shall submit in writing the names and addresses where all galvanizing, surface preparation, priming, intermediate coat application, and finish coat application are to be performed. The Engineer will arrange to visit each shop facility to inspect the surface condition of all specified miscellaneous metal items prior to shipment and delivery to the next place of work.

5. Manufacturer's Literature: Submit for approval 3 copies each of manufacturer's material descriptions for the following:
 - a. Zinc-rich primer to be used for coating bare steel surfaces left exposed at the end of the galvanizing process.
 - b. Ferrules and allen-headed screw plugs.

507.04 General: Delete section and insert the following:

A. Installation

1. Install all guardrail items in conformance to the Contract Documents and approved Shop Drawings submitted under requirements of this section. Fabrication, finish, and delivery of guardrail shall be paid for under this Specification. Installation shall be paid for under the work of this Section. Cost of transportation of all guardrail items fabricated and painted shall be paid for under this Section.
2. Guardrail shall be set plumb, straight, level, and stable.
3. For the installation of guardrail onto structural contract bulkhead cap, core drill concrete bulkhead cap for threaded rod anchors conforming to dimensions as indicated in Contract Documents, set posts in vertical plumb with approved non-shrink grout to within 0.5 inch of finish grade, and finish with an approved sealant. All care shall be taken to prevent cracks, chips, or scratches to the accepting material's surface during the installation process.
4. All posts shall be anchored into concrete bulkhead. Metal rail installer shall be responsible for coring of all holes into concrete bulkhead. Anchor bolts shall be grouted into the cored holes with non-shrink grout flush with horizontal surface as shown on the Contract Documents and in accordance with the requirements of the Specifications.
5. Contractor is required to coordinate with other trades during installation of the handrail.

B. Surfaces

1. Galvanized surfaces of metal railing shall be inspected by the painting contractor prior to the start of the work of this Section. Any defects in the surfaces such as lumps, sags, or spikes that would make the item not smooth to human touch, exposed bare steel not prime painted by the galvanizer with an approved paint from the same manufacturer of paint coatings approved under this Section, or prime paint not compatible with approved pain coatings shall be reported to the Engineer immediately by telephone followed by a hard copy letter addressed to the Engineer describing the defects. The

commencement of work by the painting Contractor shall indicate his acceptance of the surfaces of the metal railings, and he shall assume full responsibility for the work of this Section.

2. Prior to abrasive blast cleaning, all rough surfaces shall be ground smooth. All surfaces shall then be solvent cleaned in accordance with SSPC-SP1 – “Solvent Cleaning” before being blast cleaned.
3. Abrasive blast cleaning shall be performed in accordance with SSPC-SP7, “Brush-off Blast Cleaning” using a production line shot and grit blast machine or by air blast. The abrasive working mix shall be maintained such that the final surface profile is within the range specified in this section.
4. All compressed air sources shall have properly sized and designed oil and moisture separators, attached and functional, to allow air at the nozzle, either for blast cleaning, blow-off, painting, or breathing, to be oil-free and moisture-free. They shall have sufficient pressure to accomplish the associated work efficiently and effectively.
5. No surface preparation or coating shall be done when the relative humidity is at or above 80 percent or when the surface temperature of the steel is less than 5 degrees Fahrenheit above the dew point temperature as determined by a surface thermometer and an electric or sling psychrometer.
6. Surface Profile: The galvanized surface profile shall be to 1 to 3 mils. Fabricated and galvanized miscellaneous metal items shall have the surface profile measured at a minimum of 3 locations on one piece at the beginning of abrasive blast operations and at least every 4 hours and at the end of abrasive blast cleaning operations. This measurement shall be performed with both coarse (0.8-2.0) and extra coarse (1.5-4.5) Testex Replica Tape. During this measurement, special attention shall be given to areas that may have been shielded from the blast wheels. Note: When measuring the profile on the tape, 2 mils shall be subtracted (non-compressible mylar thickness) from the micrometer reading as indicated on each piece of tape.

C. Surface Preparation for Field Welding and Field Touch Up

1. Field Touch-up and Field-Welded Ferrous Metal and Galvanized Surfaces: In accordance with the requirements for surface preparation noted in this Section for Field Touch-up. All surface preparation shall be specified and performed under the work of this Section.

D. Application of Paint and Finishes to Metal Surfaces (3.03)

1. All coatings shall be applied in the shop except for field touch-up after installation. See requirements for field touch-up as described in this Section.

All surface preparation and coating work, including field touch up work, shall be as specified and performed under the work of this Section.

2. All galvanized steel surfaces shall receive the 2-coat shop paint system as specified in this Section, except the following particular locations that shall be masked off and treated as follows. Stainless steel surfaces do not need a corrosion-resistant primer.
 - a. Faying surfaces of slip-critical bolted connections shall receive only a single application of primer. The dry film thickness shall be no greater than the thickness tested on the coating manufacturer's Certified Test Report for slip coefficient.
 - b. Miscellaneous metal surfaces within 4 inches of field welds shall receive only a single coating of primer at 0.5 – 1.5 mils dry film thickness.
 - c. Galvanized steel surfaces to be in contact with concrete shall not be coated. For galvanized items to be set in cast or cored concrete walls, footings, or foundations, ensure that 2-coat paint coatings extend below the horizontal surface of the concrete by no less than one inch or as shown on the Contract Documents.
 - d. Edges and shop welds of galvanized steel items shall be locally hand-stripped with a brush in the longitudinal direction with an additional coat of the epoxy or urethane coating prior to application of the finish aliphatic urethane coating. The coating manufacturer shall be consulted to determine the appropriate epoxy or urethane coating to use for striping. The application of the striping materials shall be in accordance with the coatings manufacturer's written instructions. The striping material shall be tinted to distinguish it from the intermediate coats.
3. Application methods: The coating system shall be applied by spray equipment of a type and size capable of applying each coat within the required thickness range. The applicator shall strictly adhere to the manufacturer's recommendations about application methods, cure times, temperature and humidity restrictions, and recoat times for each individual coat of the specified system. Brushes shall be used in areas where spray application will not achieve acceptable results. Brushing technique shall be performed in a manner that will provide a uniform, blended finish. No coating material shall be thinned in any way except as directed by manufacturer.
 - a. Conventional spray equipment with mechanical agitators shall be used for prime coat application on bare steel and for epoxy or urethane intermediate coat on galvanized surfaces.

- b. All storage, mixing, thinning, application and curing efforts, techniques, and methods shall be accomplished in strict accordance with the printed material data sheets and application instructions published by the respective coating material manufacturer.
 - c. Surfaces shall be painted with the specified prime coat material before the end of the same work shift that they were blast cleaned and before any visible rust back occurs.
 - d. Applied coatings shall not have runs, sags, holidays, pinholes, or discontinuities.
 - e. The dry film thickness shall be within the range specified in the manufacturer's printed literature for the specified coating system. Dry film thickness shall be measured in accordance with SSPC-PA 2.
 - f. The intermediate coat shall be of a contrasting color to the prime and topcoat colors.
 - g. There shall be no color variation in the topcoat as determined by comparison with Federal Standard 595B.
4. All storage, mixing, thinning, application and curing efforts, techniques, and methods shall be accomplished in strict accordance with the written requirements and procedures published by the respective coating material manufacturer.
 5. Additional coats: Provide additional coats necessary to eliminate show through and bleed through conditions.
 6. Drying Time: Allow manufacturer's recommended drying time between successive coats. However, allow each coat to thoroughly dry prior to application of subsequent coat.
 7. All compressed air sources shall be properly sized and designed with oil and moisture separators, attached and functional, to allow air at the nozzle, either for blast cleaning, blow-off, painting, or breathing, to be oil-free and moisture-free. It shall be of sufficient pressure to accomplish the associated work efficiently and effectively.
 8. Surfaces not in contact with other steel surfaces but inaccessible after assembly shall be coated prior to assembly.
 9. Critical attention shall be given to edges and bolted connections. All bolts, nuts, and washers shall be fully coated and no gaps left unfilled and uncoated. Stainless steel hardware shall not be painted.

10. Adhesion strength of the fully coated assemblies shall be within 80 percent of the values for Adhesion as described in the approved manufacturer's literature measured per ASTM D4541 using apparatus under Annex A4.
11. Strict attention must be directed to the re-coat times of all applied materials. Shop bolted connections shall also have all bolt heads and nuts striped in a circular brush motion with the same material.
12. All applied coating shall have no runs, sags, holidays, or discontinuities; the dry film thickness shall be within the range specified. There shall be no color variation in the topcoat as determined by Federal Standard 595B. Also, there shall be no gloss variation in the topcoat where tested in accordance with ASTM D523.

E. Field Touch Up

1. Touch up and repair finishes that, for any reason, have been damaged during construction work.
2. Field application of coatings shall be in accordance with the manufacturer's written application guidelines and these Specifications. All areas cleaned to bare metal must be coated with a zinc-rich primer before any visible back rust occurs. The topcoat material for field touch-up painting and additional field topcoat application shall be from the same lot and batch used in the shop provided its shelf life has not expired. If the shelf life has expired, the same material of the same color from a different lot and batch shall be used. The materials used for the field primer and intermediate coat must be compatible with the shop primer and intermediate coats.
3. All rust, scale, dirt, grease, concrete splatter, and other foreign material on connections, bolts, nuts, and around field welds shall be completely removed by power tool cleaning per SSPC-SP 11. Areas cleaned to SSPC-SP 11 shall have a 1-3 mil profile and must be primed prior to rusting. All debris generated from cleaning operations must be contained and properly disposed of.
4. Bolts, nuts, and washers shall receive brush applications of intermediate and topcoat after final tensioning. Careful attention shall be given to bolted connections to insure that all bolts, nuts, and washers are fully coated and that no gaps are left unfilled and uncoated.
5. Field welded areas shall be treated in the same manner as shop welded areas, including special treatment requirements.
6. At damaged areas that extend back to the steel surface (such as scratches, gouges, or nicks), the entire three-coat system shall be locally reapplied after

power tool cleaning to bare metal in accordance with SSPC-SP 11. The coating system adjacent to the damage shall be feathered back to increase the surface area for touch-up painting. The area cleaned to SSPC-SP 11 shall be primed with a zinc-rich primer before rust back occurs. The coating manufacturer shall be consulted to determine the appropriate zinc-rich primer to use. Application of the zinc-rich primer shall be in accordance with the coating manufacturer's written instructions. The specified intermediate and topcoats shall be reapplied in accordance with the manufacturer's written instructions.

7. At damaged areas that extend back only to the prime or intermediate coat, the area shall have the topcoat applied. Application of the touch-up materials in these damaged areas shall be performed by brush only.
8. Tarps shall be used to collect all surface preparation debris. The Contractor shall be responsible for disposing of all removed materials, including tarps.

507.06 Steel Pipe Railing: Delete the word "Pipe", Delete the Section and insert the following:

A. Quality Standards

1. The current issue of Standard Code of Arc and Gas Welding in Building Construction shall apply to this Section as though written out in full. Welding shall be in accordance with the Structural Welding Code of the American Welding Society.
2. Where structural joints are made by welding, the details of all joints, the techniques of welding employed, the appearance and quality of welds made, and the methods used to correct defective work shall conform to requirements of the AISC and AWS codes.
3. Welds shall be made only by welders who have previously been qualified by tests as prescribed in ASW "Standard Qualification Procedure" for the type of work required.
4. All dissimilar metals shall be insulated to prevent bimetallic interaction.
5. Workmanship and finish shall be equal to the best practice of modern shops for each item of work. Metal fabrication shall be accomplished using the highest standards of workmanship. All work shall be executed by experienced metal workers, shall conform to the requirements of the Contract Document, and meet the following:
 - a. Individual metal pieces shall be saw cut and carefully fitted together.

- b. Sections shall be well formed to shape and size with sharp lines and angles; curved work shall be sprung evenly to curves.
 - c. Exposed surfaces shall have a smooth finish and sharp, well defined lines and arrises.
 - d. Grind all edges of bars and plates completely free of from nicks and machine marks prior to galvanizing or shop priming.
 - e. All surfaces and connections of metal items shall be without visible grinding marks, surface differentiation, or variation.
 - f. All fabricated metal items shall be fine sanded throughout to produce a high standard of surface smoothness.
 - g. Castings shall have sharp corners and edges and shall be clean, smooth, and true to pattern.
 - h. Welding shall be continuous and shall extend for the entire length of the joints except where specifically indicated on the Contract Documents. All exposed welds shall be ground smooth.
 - i. Weld with uncoated wire to prevent flux deposits. If coated wire is used, all flux residue shall be thoroughly removed and bare white metal exposed prior to galvanization if applicable. Where overlapping surfaces are welded, seal off contact area by welding all edges around contact area.
 - j. All welds shall be water tight.
 - k. Drilled and tapped holes shall be set 90 degrees from face surface and in alignment to meet the requirements of the Contract Documents.
 - l. Holes for bolted connections shall align within tolerances shown on the Contract Documents.
 - m. All shop connections shall be full seam welded and ground flush and smooth. Field connections bolted, unless otherwise permitted, as indicated in this Section. Draw up all threaded connections tightly, after buttering same with pipe joint compound, to exclude water. Deform threads to prevent loosening for all exposed connections subject to vandalism.
6. Where the work of this Section must be attached to other materials or where it must be assembled and installed in the field, Contractor shall cut, drill, punch and ream, countersink and tap, or otherwise provide the required holes in the shop, unless such connections are to be welded. The sizes and locations of all such holes shall be shown on the Shop Drawings.

7. Metalwork to be built in with concrete or masonry shall be of the form required for anchorage or shall be provided with suitable anchors or expansion shields.
8. All materials and workmanship under this Section shall be subject to inspection in the mill, shop, or field by the Engineer or by qualified inspectors retained by the Owner. Inspection shall be without expense to the Contractor. However, such inspection, wherever conducted, shall not relieve Contractor of his responsibility to furnish materials and workmanship in accordance with Contract requirements.

B. Metal Fabrication - General

1. Take all measurements required at the work site. Check measurements, compare dimensions and other data with various trades installing adjoining work to assure proper coordination.
2. Do all shop drilling, tapping, shop fitting, shop cutting, shop welding, and bolting required to erect, install, and fit metal work to adjoining work. Conform to AISI Code for Steel or Stainless Steel as applicable. Furnish all screws, bolts, anchors, etc., required to attach metal work securely to adjoining work.
3. Welding shall be continuous except where tack welding or stitch welding are specifically permitted. Tack or stitch welding will not be permitted on exposed surfaces. All exposed welds shall be ground smooth.
4. Do not enlarge unfair holes by burning and forcing, but correct by reaming.
5. Install all supports and anchors for metal work except those to be cast into concrete as indicated.
6. Furnish all required metal inserts, anchor slots, anchors, anchor bolts, fastenings, etc., for attachment of work of all trades to Cast-In-Place Concrete, except where otherwise specified or obviously included under other Sections of the Specifications.
7. Weld with uncoated wire to prevent flux deposits. If coated wire is used, all flux residue shall be thoroughly removed and bare white metal exposed. Where overlapping surfaces are welded, seal off contact area by welding all edges around contact area.
8. Except as noted, all steel work for the guardrail shall be fabricated in accordance with Section 10 ("Architecturally Exposed Structural Steel") of the AISC "Code of Standard Practice for Steel Buildings and Bridges", 2000.

9. Weld cast iron components to carbon steel pieces using appropriate nickel-based electrodes prior to galvanizing. Clean surfaces thoroughly prior to the start of welding operations. Preheat casting as necessary to reduce cooling rate and residual stresses and to eliminate distortions and cracking. Use short stitch welding beads no longer than one inch in length. Welds shall not be visible to public after erection of metal railing. Grind welds smooth. Peen as required to reduce stress and refine metallurgical structure.

C. Finish Schedule

1. All metal items fabricated under this Section and all hardware shall be colored and finished in accordance with the following finish schedule of this Section and specified and performed under this Specification.

2. Finish Schedule:

Color	Item	Galv.	Two-Coat Paint System (see Section 09000: Painting)	Unpainted, Finish Stainless Steel as specified
Pure Black	Posts, Railings, and Pickets not designated as “stainless steel” finish	Yes	Yes	
None	All members noted on the Drawings as “stainless steel” finish including the “Arc”, the Handrail, and the associated hardware. Ferrules and plugs.	No	No	Yes